

Aarhus Workbench release history

Date	Version	History
03.02.2012	4.0.1.705 WS 69	Corrected bugs <ul style="list-style-type: none">• In order to import models with the Groundbased TEM models (Danish users only) importer (2968):<ul style="list-style-type: none">○ Choose one or several datasets on the left part of the form with the button "..."○ Choose one or several emo files on the right part with the other button "..."○ Select the dataset and the emo file you want and then, the Import button will be available.○ Before importing, you also need to set the Preferences and the Edition settings with the corresponding buttons• The options 'White as transparent' and 'Translucency' does not work when creating bitmaps from grids, or adding already existing bitmap layers to the map. Creating a bitmap from a grid will also result in the warning 'File not found: xxx.bmp', although the bitmap is created successfully. The issue has been fixed, and the options should now work as before (2966)• GIS now flushes the layer memory cache whenever the maximum size of used memory is exceeded. This done automatically, and without displaying warnings to the user. The symbology for cached layers and disk-based layers is now also the same. This will improve overall performance significantly (2963)
01.02.2012	4.0.1.704 WS 69	New features <ul style="list-style-type: none">• It is now possible to add topography directly when processing nodes. The DEM nodes list is displayed in a drop down, on the Processing Management form. Check the DEM option on and select one DEM node on the list. The corresponding grid file will be read and the topography applied to the node (1777) Corrected bugs <ul style="list-style-type: none">• GIS now flushes the layer memory cache whenever the maximum size of used memory is exceeded. This done automatically, and without displaying warnings to the user. The symbols for cached layers and disk-based layers are now also the same. This will improve overall performance significantly (2963)
31.01.2012	4.0.1.703 WS 69	New features <ul style="list-style-type: none">• New version of the GIS component added
30.01.2012	4.0.1.702 WS 69	New features <ul style="list-style-type: none">• Improved performance, when working with large vector layers, from caching of layers in memory. This can be enabled/disabled under Preferences->GIS.• Speed has been very much increased when loading models for making themes. This is especially significant for large

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surveys (2953)

- When setting up a SSV between two grids a check for crossing or touching grids has been added (2779)

Corrected bugs and minor changes:

- The point size is now set correctly when using the 'Edit Display' dialog (2947)
- A database rebuild error has been fixed for copying new inversion nodes (2585)

17.01.2012 4.0.1.701
WS 69

New features

- GERDA export for reporting CVES 1D and 2D models to the national Danish master database is now supported (2944)
- When editing the color scale for a DBQ Profile layer, the resistivity is now input into the color scale wizard. Therefore the color scale can be optimized to the data, e.g. min./max. resistivity values (2876)
- DEM can now be used when adding topography (2870)
- Minor changes in the workspace wizard have made it better to use (2802)
- A filter has been added to the 'Add DBQ' to profiles form (2790)
- An unsupported data type error has been fixed (2754)
- Fixed a bug that could prevent making DBQ's of models imported using the general model importer (2753)
- Creating bitmap images has been speeded up (2748)
- The option Close EMBL... is now also available when workbench is not in debug mode for the LCI inversion settings form (2606)
- When exporting time domain Rhoa data to dat/syn xyz files, the data converted to dB/dt and the corresponding STD's are exported as well as extra columns as well (2584)
- When a profile is created a unit is selected (Ohm-m, mS/m or mS/cm). When DBQ as bars and 3D grids are added later on, they will be shown as resistivity or conductivity in the selected unit (1690)

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Corrected bugs and minor changes:

- A given when adding raster layers to the map that have a different coordinate system than the map has been removed, as the GIS-component projects the layers correctly (2945)
- It was not possible to edit the order of the layers in the layer manager of the GIS, using drag-and-drop. This has been fixed. Drag-and-drop-moving of layers is now possible again (2943)
- Bug fixed to the load the inversion settings, on the LCI inversion settings form (2922)
- It is now possible to write in the field Max Sounding Gap on the LCI inversion settings form (2921)
- A bug in visualizations of data residual has been fixed. (2843)

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- Some settings in the Settings Inversion of LCI jobs were not read from a loaded INV file (2813)
- The DOI information from EMO-files is now correctly imported in the ground based TEM importer (DOI tables were empty) (2807)
- Now visualization of data residual is also working for other data than skyTEM, e.g. tem40 (2806)
- When resizing bar on a profile, DOI fading no longer disappears (2743)
- 'Grid as line' on profiles now remember the last line format setting (2712)
- When adding a priori on a selection of points, it is now possible to change all layers at the same time (1872)
- Now it is possible to edit the DOI fading settings on DBQ bars on profiles (1792)
- The time it takes to copy a profile (not shifted) has been reduced (1790)
- Several enhancements to the VIS node creation has been made (1688)

Known issues

- Problems setting model editions for CVES data. This issue will be fixed before the end of January in both the 1D and 2D case.
- Full installation can not find .MSI file. Cancel and restart installation. Please refer to notes on home page.

12.01.2012 4.0.0.700
WS 69

New features

- Completely revised GIS user interface
- New installer
- Firebird server installed in classic mode to support multithreading

Corrected bugs and minor changes:

- When synchronizing profiles, they are now correctly send to top if e.g. hidden by the map (2910).
- New button added on the "Welcome Form", when Workbench is loaded: Open Latest Workspace. This button opens the last used workspace. The shortcut "Enter" can also be used (2874).
- It is possible to make a bitmap of a DEM directly from a DEM node. If one however uses show color scale on that theme one will get the attached error. The theme type is not recognized (2848).
- Fixed issue with forward response not being calculated for all SkyTEM models in an SCI inversion (2825).
- Fixed problems with Scembi error messages being suppressed (2825).
- Issues related to showing the "Select SCI Dataset" form solved (2824).
- Fixed a bug in the sounding time stamp implementation for SCI inversions of airborne data that caused all times to

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- appear as 0.0 (2817).
- Spaces are now allowed in the groundbased TEM importer (and all other importers) (2811).
- Groundbased TEM importer setting edition bug fixed: When importing more than one edition to the same database all models in the database got the previous edition name (2805).
- Using the importer "Import of data and models (SiTEM/Semdi) caused an error "Unable to read SiTEM data". This has been fixed. Another issue that raised a range check error has also been handled (2798).
- Now termination of the bottom layer and DOI blinding is initialized correctly in the 'show inversion result' for new users (2773).
- Fixed an issue that could cause an exception when working with logarithmically spaced color scales. (2772).
- The bias plots in the inversion explorer systems has been changed to show CRC plots. All references to bias is now referenced in terms of coil response correction (2770).
- A SCEMBI issue when using a very large number of CPU's has been fixed (2768).
- Fixed display update issue in the inversion dialogs "Omit gates from inversion" (2760).
- Manual variogram settings are now working properly (2757).
- Fixed an importer edition bug for TEM 40 type systems. (2725).
- Fixed a SCEMBI licensing issue (1537).

Known issues

- Problems setting model editions for CVES data. This issue will be fixed before the end of January in both the 1D and 2D case.

14.11.2011	3.3.16.644 WS 69	Corrected bugs <ul style="list-style-type: none"> • A fix has been made for coil correction, lateral STD for SCI to follow same conventions as other STD constraints. 1.05 is now 5% not 500%
10.10.2011	3.3.16.643 WS 69	Corrected bugs <ul style="list-style-type: none"> • Fixed a bug that came when adding "Add Grid as Line.." to profiles.
06.10.2011	3.3.16.642 WS 69	Corrected bugs <ul style="list-style-type: none"> • Synchronization between profiles failed, a fix for this has been made.
26.09.2011	3.3.16.641 WS 69	Corrected bugs <ul style="list-style-type: none"> • Termination and DOI blinding were initialized in-correct in 'show inversion result' for new users. This has been fixed.
19.09.2011	3.3.16.640 WS 69	Corrected bugs <ul style="list-style-type: none"> • Now Export from a SkyTEM node is working again.
09.09.2011	3.3.15.639 WS 69	Corrected bugs <ul style="list-style-type: none"> • An error has been fixed where gates would suddenly be

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deleted when pressing the update button in the processing window for AEM data.

- Fixed a bug in the selection bars on Model Section showing profiles for SCI – SkyTEM.
- Now Export of .tab and .tif from a bitmap node works again.
- To prevent the color scale editor to freeze when working with very big grids these grid can no be shown in preview and the histogram is not calculated. This only applies for files larger then 10 MB.
- Fixed and access violation when running SCI inversion with HEM and VTEM data and a-priori information.
- Fixed a bug in the AEM (SkyTEM) importer which on some machines would give an access violation when importing data several times to the same dataset.
- Altitude settings in the SCI wizard were not always restored correctly from the database and registry. This has been fixed.

New feature

- DEM grids are available in the "Add Grid as Line" on profiles.
- There is a filter search added to "Profile Settings for Grid as Line".

26.08.2011 3.3.14.638
WS 69

Corrected bugs

- Fixed a bug in the selection bars on Model Section showing profiles for SCI – SkyTEM.
- Fixed a bug where SSV -in depth intervals- sometimes did not start from 0m
- The display of numbers for thickness in SCI-setup did not have the same number of decimals for values coming from the registry and for values coming from the “compute” button.
- The display of values in the inversion explorer has been changed.
- If the model position explorer settings is set to fixed, then the first use of the black arrows in the model position explorer now simply selects the first (arrow down) or last (arrow up) fixed scroll buffer possible.
- The average sign filters are now always re-applied when pressing the update button from the processing screen. This prevents situation where dbdt data can be negative because of manual editing's.

New feature

- 3D grids on profiles now have 'holes' where the mean resistivity maps have 'holes'.
- Import of groundbased TEM data to GERDA is now possible. The changes for CVES and PACES has been made but is not tested.

08.08.2011 3.3.14.636
WS 69

Corrected bugs

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- Fixed a bug with DOI in the inversion model explorer.
- The error “Data type not supported in TinvDataProfileMapper.SetModelIDs” has been fixed. The error came when the “Model Position Explorer” was selected for SCI.

08.08.2011 3.3.14.635
WS 69

Corrected bugs

- In connection with database compiling with data from the workbench, there could be differences in thicknesses of layers and associated layer thicknesses. This has been corrected.
- Fixed an issue in the print ready wizard that causes an error when re-selecting the GIS window.
- Fonts was not always saved correct in the print ready wizard, this has been fixed.
- Fixed bottom layer check against drill depth when loading boreholes from file.
- It is now possible to set the point symbol on the SSV borehole editor form.
- Fixed an allocation bug in the DOI calculation sometimes causing the program not to calculate DOI.
- A number of issues for SCI inversion settings has been addressed.

New feature

- DOI fading is implemented on the “Show Inversion Result” system. On the “Model Section Form” select show as Bars. Press “Bar & GIS”, then press “Bar Section Setup” on the “Model Display” tab
- The new geo file version 8 now support B field
- Several Bitmaps/3Dgrids/ Interpolated DBQs can be shown at the same time. Please note that the order of the layers shown is important.
- In “Themes slide show” it is now possible to filter on theme types, e.g. elevation, resistivity etc.
- The properties on VIS nodes are now also showing which INV-node it belongs to.
- The visualizations can now be created from a DBQ.
- The pitch values can be visualized if X-data is present.
- A progress bar is shown for DOI during LCI and SCI run. The number of iterations is shown both in the log and on the form for the current progress of the DOI calculation.
- The menu item “New SkyTEM processing” has been renamed to “Airborne TEM Processing”.
- A new “Open workspace wizard” has been implemented and this wizard is shown when the Workbench is started.
- There have been implemented general improvements for color scale system.
- A number of improvements for selection management in models explorer form have been made.

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- During SCEMBI inversion a new display for DOI progress bar is show.

13.06.2011 3.3.14.634
WS 69

Corrected bugs

- The axis settings were not stored from the print ready wizard to the project file
- SSV themes have now the correct labels on color scales.
- In 'Visualize data and inversions' the previously selected gates and channel/gates are now remembered
- A check has been added so only 24 days of data can be stored in a single SkyTEM processing node.
- Now 3D grid layers on profiles can be copied, after a workspace has been moved.
- The 'new theme' from DOI Themes can be produced for depths as well as elevations. Furthermore the DOI elevation min/max values have been added to the statistics on the histogram.
- Now 3d grid layers on profiles can be copied, after a workspace has been moved.
- A bug in PACES data visualizations has been fixed.

New feature

- The SSV functionality has been updated to support several new functionalities making the flexibility of the SSV-module much larger. The previous version worked on depth intervals only, which is of course still supported. The improvements include:
 - SSV calculation in elevation intervals. Up to 6 intervals can be handled at one time - for instance 10 meter intervals from elevation 0 m to -60 m.
 - Calculation from a user-defined surface (defined by a grid-file) and a set number of meters above or below.
 - Calculation between two surfaces (defined by grid-files).

The automatic clay-content generator retrieving data from Jupiter has been updated to support these features and the procedures retrieving the Jupiter data has been re-written completely.

- Digital Elevation Models (DEM node) can now be gridded and made to a bitmap.
- The selected points use in 'Add a-priori from GIS' can now be saved in a file and reused.
- The ssv.exe file has been updated in connection with the SSV module revision.
- Bitmaps can be created from a digital elevation model (DEM node)
- Missing data in 3D grid profiles are now shown as blank

07.06.2011 3.3.14.633
WS 69

Corrected bugs

- The different wizards in the Workbench now remember their size and position.

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- Several new checks has been added to the importers for all other data types than SkyTEM (e.g. VTEM).
- '/' now accepted as delimiter in the importers for all other data types than SkyTEM (e.g. VTEM).
- The LCI inversion did not work in manual mode, this has been fixed.
- The GPS beat time in the airborne TEM processing system can now be up to 5 sec.
- An error in the new airborne importer calculating time stamps from helicopter speed and distance between points has been corrected. Now the time spacing between adjacent sounding points can only be up to 4 minutes (hardwired to 4 minutes in the importer).
- An error which in some cases prevented reading the TXD line in the SkyTEM SPS files has been corrected.
- In the DBQ wizard (called from map level) it is now possible to filter on elevation values.
- The popup menu on the profile form did not contain formatting of the bottom axis, this has been fixed.

New feature

- The open workspace form has had made minor redesigns.

12.05.2011 3.3.14.631
WS 69

Corrected bugs

- Adding a a-priori between grid on SCI nodes, undefined values in the grids are now handled correctly
- When adding a-priori between a grid on SCI nodes, a problem with coordinate system file has been solved.
- Final report pages: Alignment of legend boxes is now correct. Also fixed some minor design issues.
- Color scale: precision increased in the display of color bars. LVL conversion improved and a bug has been fixed in saving the color scale. The management of the registry saving has also been improved.
- Import data: checks has been added for the data type before launching the import.
- Fixed a bug that could cause dummy values to be written to the altitude fields of exported .syn and .dat files for SCI inversions.
- Model exporter code modified in order to support arbitrarily large surveys.
- Small fixes around *.las file load in Add Apriori from Conductivity Logs.
- Survey info: a database error has been fixed (violation of foreign key rdataset_client)

New feature

- When the Workbench is launched a the user is meet with a new dialog box showing the last used workspaces and a browse link. This box is also shown when the menu file.open is activated.
- Data residual is now imported through the general model

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		importer when .dat and .syn files are skipped.
		<ul style="list-style-type: none">• Implement properties for grids made on visualizations
07.04.2011	3.3.14.629 WS 67	Corrected bugs <ul style="list-style-type: none">• A bug where histogram themes made it impossible to batch grid has been fixed.• Fixed a bug that could cause the color scale loader to hang when loading some old .lvl files.• SCI "run inversion when done" – did not work, this has been fixed.• A bug causing a access violation in the function for re-applying geometry information to a SkyTEM dataset node has been fixed. New feature <ul style="list-style-type: none">• Color scales and point sizes have been added to the visualize data and inversions modules.• It is now possible to add a-priori resistivity values to all layers between two grids from an SCI node. .
24.03.2011	3.3.14.627 WS 67	Corrected bugs <ul style="list-style-type: none">• The selected point settings e.g. colors in the DBQ wizard are now applied correctly.• A fix has been made so the general data importer now can handle time columns.• Sometimes the 3D grids on profiles did not cover the entire length of the profile. This is now fixed.• Issues concerning the DEM file i xyz format has been handled.• The coordinate system in the coordinate selector was not applied correctly in the general model importer. This has been fixed.• Bias times was not shown correctly under SCI properties (6.39000e-06 became .39000e-06).• Some Inversion nodes could not be found under export of models. A fix for this has been applied.• Now the properties for 3D grids on profile, always shows the used mean resistivity grid.• Numbers of minor ticks on log color bar is now correct. New feature <ul style="list-style-type: none">• The advanced filtering in the DBQ wizard now supports 1d MCI models.• DOI moved to separate tab in Visualize data and inversions.• The Selected points for 'Add a-priori GIS' can be saved to at file. Next time the 'Add a-priori GIS' is called, and not points are selected, the user can select the same points by loading the file.• All profiles can now be shown/hidden on the GIS map from the main profile node.• The time management of the VTEM importer has been improved in order to have a better behaviour between two

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flight lines. A factor of 1000 times the sounding distance is added between each line if no time is found in the xyz file and if sounding distance is used. If Nominal speed is used, then a factor of 1000 times the average sounding of the previous line is added between two lines. The sounding distance value is not limited from 0.1 and 10 seconds.

- The general airborne TEM importer now supports line number in columns, with the prefix L, Line or /Line.
- The TEM import user interface have been improved.
- When calculating DOI only emo-files are deleted on-the-fly.
- Last used Bias Inversion, Factor, Lateral STD, A-priori STD and File in the SCI Setup Wizard was not stored in the registry. They are in the registry now...
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03.03.2011 3.3.13.625
WS 67

Corrected bugs

- A bug regarding the SCI wizard settings has been fixed.
- The option to load boreholes from ASCII file has been fixed and enabled again in Add/Edit Borehole form. Also, the file format has been slightly changed. Ask for example if needed – it's not in the help system yet.
- SCI: A temporary file was not written correctly.

New feature

- In gridding a new system to interpolate an image has been implemented making it easier to understand how to select the right settings. This also solves a problem with shifting pixels.
- Grid files saved now as binary files for speed and reduced file sizes.

17.02.2011 3.3.13.622

Corrected bugs

- A check has been added to prevent processing interval to be smaller than 2 months.
- A check has been added so GPS relocation is only done when the GPS is moving.
- Grid properties issue fixed.
- Batch gridding with inverse distance issue fixed
- Export data or models issue fixed: All models are now correctly displayed

11.02.2011 3.3.13.620

New features

- User can now specify the default windows temp folder, used e.g. for temp files during inversion
Go to > file\preferences..\workspace
- The GPS positions can now be shifted in the flight direction in order to shift the positions to the focus point of the transmitter-receiver coils (which is close to the receiver coil). The shift is given in the GPS processor
- New right click menu facility to insert or remove colors on RGB colors in the colorscale wizard

Corrected bugs

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- When defining the processing settings for raw data, it is checked that the trapez filter is set to On. The user can still ignore the warning and use straight averages.
- A check for gate center times between open and close gate has been added to the geometry file reader.
- Adding a tab file which is a "collection" of tab files to a layer did sometimes giving an error preventing the workspace to open. This has been fixed
- When the transmitter altitude is not defined the altitude is set to a user specified default value. The offset between the transmitter and the receiver as specified in the geometry file is now added to the default value
- "Hanging" curves in the SkyTEM processing systems is now avoided by deselecting a sounding points before moving the buffer etc
- Data can now be processed without pitch and roll information, either because there are not such information or the device number is set to None in the processing control window
- When the GPS location is re-located to the receiver coil location for SkyTEM data, a check has been added to ensure that the correction is only done when the GPS position changes by more than 0.01 meter per second
- SCI Wizard: some issues fixed when loading a settings file on the last wizard page
- SCI Wizard: random issue with unique key violation fixed
- SCI Inversion: delete datasets issues between run 1 and run 2 and after the run 2 fixed : all tables are now correctly cleared.
- Batch gridding and gridding: issue with coordinates fixed
- Batch gridding: size of the area can be changed again

07.02.2011 3.3.13.619

Corrected bugs

- Batch gridding: Size of selection is now fixed, the max size of the DB query is set up and the search radius is correctly applied. (No more increasing values).
- SCI Wizard: fix of load settings function and fast settings mode.
- Add a-priori from grid or lines:
 - Added a check for positive values for depth, resistivity, conductivity and STD values.
 - The filter for file selection selects both .grd and .awi files.
 - Add a-priori from GIS: Fixed a bug when modifying values.
 - It was possibly to have the same names for mean resistivity themes, this is now fixed.

25.01.2011 3.3.13.618

Corrected bugs

- Merge boreholes with other Jupiter database" in "Add/edit

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Borehole". Also, improved DB merge performance.

19.01.2011	3.3.13.617	Corrected bugs <ul style="list-style-type: none">• Fixed an error deleting an inversion node.
18.01.2011	3.3.13.616	Corrected bugs <ul style="list-style-type: none">• Export of data to an GERDA upload did not copy the table SKYPROCSEG table.• Upgrade problem of old workspaces solved.• Unsuccessful metadata update (CONSTRAINT FK_ODVDOI does not exist) error fixed..
13.01.2011	3.3.13.615 WS 65	New features <ul style="list-style-type: none">• Upload to GERDA. Data and models in multiple versions can now be transmitted via a range of new features in WB and changes in the GERDA database. To get this to work effectively, reporting shall be made in two steps: first reported crude and processes data and then transmitted LCI / SCI few and many-layered models. In this version there is only opened up to the reporting of SkyTEM data.• The functionality to extract models and generation of geophysical themes are brand new and supports extraction where there are multiple versions of models at the same probing. It is also possible to create very advanced filters among the models.• Creation of geophysical themes have become far more flexible and intuitive to work with, and there are now also produced a series of new themes and filters of specific resistance ranges.• 3D grids and other improvements. In the previous version of WB, there was a wide range of improvements up function. We now also summed the ability to put depth mapping onto 3D grids, making it a great tool to get a quick overview of the information in the geophysical models and geology.• The applications main form and the workspace manager form are "glued" together. The workspace manager form is always placed to the left below the main form.• In the Inversion explorer form two new buttons has been added: Up and down arrows with the short cuts: ALT+UP and ALT+DOWN. When pressing these buttons the next or previous lines are selected.• In the Workbench.File.Preferences it is now possible to enter the default coordinate system that is to be used in for example the dialog box for adding topography to SkyTEM. If no information is changed in the preferences the default system is UTM Zone 32N (WGS 84)\p32632 but it can be changed to all of the supported coordinate systems in the Workbench.

Corrected bugs

- A check for data values equal to zero has been added to the HEM importer to preventing floating point errors.
- Fixed a bug, which made the batch gridding hang after it finished (seen on the PC's in the computer room at geo)
- When updating a SSV node with boreholes, DisableML1...DisabelML6 is set to 'No' and 'Lock AC' is set to 'No' for new boreholes.
- Saving a GIS map the file format was correct but the file extension was wrong.
- Temporary files are now written to the correct temp directory in the import of airborne TEM data.
- 3D-grid profile resolution: The resolution of the 3D grid can now be set to normal, fine or extra fine.
- New default for profile label on GIS map, the default style for labels is a black bold font with a yellow halo.
- A bug in adding fence grid profiles has been fixed, so the numbers of East-West and North-South profile lines now are correct.
- Added more intuitive minimum and maximum data value selection for color scales.
- A bug has been fixed in the 'Edit display' on a 'Grid as line' profile layer.
- When making at new workspace the user is prompted for a folder name and all the internal files for this workspace is stored in this folder.
- When loading rock symbols from ASCII file the last layer was not added to the list of selected rock symbols and QL was missing from rock symbols.
- GCM import has been debugged and works now.
- The default coordinate system for external file importer has been changed to WGS 84, zone 32N
- The warning for the number of models selected in the inversion explorer has been raised from 250 to 1000.
- When adding topography from file to SkyTEM the form now remembers the last file name entered.
- Prior to applying a new geometry file for a SkyTEM dataset node any open edit windows are closed
- A geometry file can now be applied also when the database holding the data is not active.
- Soundings with the altitude not defined (NaN) is now always deleted when deleting soundings outside altitude limits directly from the SkyTEM edit window.
- A check for gate centre times between open and close gate has been added to the geometry file reader.
- The helicopter speed is now calculates as a running average over 30 sec.
- A bug has been fixed, when zooming on a 3D grid on a

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profile.

- When the 'Visualize Data or Inversion' form is open, it is now possible to click on the tree, e.g. showing a color scale.
- New auto centre functionality has been added in the 'Show Inversion Result'. The settings are found in the settings on model section plot form. If a model bar is clicked, the map moves if the model is outside the map.
- The 3D grid form now remember previously used elevation grid.
- Deleting a marked node in the SkyTEM edit form does not delete the related files on disk.
- The gridding did not delete all temporary files after finishing the job (.eas and .log files). These are now properly deleted after successful run.
- The Abort button could in some cases is active after successful run of the data base rebuild. This has been fixed.
- Properties for bitmap nodes again work as intended.
- Software channel group were not initialized when showing properties.
- In the open database dialog box it was possible to select Access databases which are not supported anymore. This option has been removed.
- The geo file can now contain tab character. Workbench will be able to read the file anyway.
- The grid stat form is now showing fewer error messages if the user mistypes characters in the edit fields..
- Minor design changes in the LCI inversion settings form.
- EMBI and SCEMBI: To prevent a “dead lock” situation it is not possible to change the number of CPUs while inversion is paused. Bjarke kommer med tekst ::::::::::: One cans however ones again stop the inversion during such a change.
- When adding a DBQ to a profile the Workbench now correctly remembers the last color scale used in such a manner.
- Rebuilding a database from an SCI node gave several errors, this has been fixed.
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27.09.2010 3.3.12.614

Corrected bugs

- There was a problem when gridding themes, this has been fixed.

23.09.2010 3.3.12.613

Corrected bugs

- SSV: New database driver added, search results are now visible.

Documentation

- Help file updated with new features e.g. SCI

20.09.2010 3.3.12.612

Corrected bugs

- Inversion: Temporary file is now written in correct temp.

directory.

15.09.2010 3.3.11.610

Corrected bugs

- Application icon re-inserted

14.09.2010 3.3.11.609
WS 61

Corrected bugs

- The SSV module is now working on all tested servers / computers and the internal database engine problems has now been overcome. Due to a strange behaviour of the Firefox database engine we now only uses stored procedures and not user defined functions (UDF's accessed from the GEUS.DLL).
- When loading rock symbols from ASCII file the last layer was not added to the list of selected rock symbols (SSV).
- Note for the SSV-module:
When using the auto-clay generator to produce automatic clay thicknesses for an interval in which a borehole terminates, the auto-clay will still produce a number. An example: Borehole "A" ends at 24 meters and you are requesting the clay-thickness for the 20-30 meter depth interval. The auto-clay will then give you the amount of clay from 20-24 meter from borehole "A" and use that as the 20-30m interval value. The easiest way to avoid this is to make a BHQ that only contains boreholes that go deeper than the requested intervals.
- When updating a SSV node with boreholes, DisableML1...DisabelML6 is set to 'No' and 'Lock AC' is set to 'No' for new boreholes.
- The color scale editor has been improved and new color scales can be created using a wizard.
- A bug has been fixed in the 'Edit display' on a 'Grid as line' profile layer.
- When adding a DBQ to a profile the changes to the color scale attributes smooth and log did not always show correctly on the color scale. This has been fixed.
- When creating a new workspace, the user is now prompted for a workspace name in addition to the destination folder. The workspace is then created in a sub-folder with the workspace name within the destination folder.
- Saving a GIS map the file format was correct but the file extension was wrong.
- Bitmap properties have been re-implemented for Grid settings.
- When updating a SSV node with boreholes, DisableML1...DisabelML6 is set to 'No' and 'Lock AC' is set to 'No' for new boreholes.
- The Export functionality, now exports a new file with DOI info (only if DOI is present)

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14.07.2010	3.3.10.608 WS 58	Corrected bugs <ul style="list-style-type: none">• Missing sections error in SCEMBI has been fixed• Not any longer writing to C:\Temp
29.06.2010	3.3.9.606 WS 58	Corrected bugs <ul style="list-style-type: none">• Now the plotting of models with different number of layers on a profile is working.• Added model plot to EMBI• If the buffer zone is shown on the GIS map, when the profile layer is deleted, the buffer zone now disappears from the GIS map. Before it was hanging, and could not be deleted.• Minimum and maximum altitudes are now imposed in the processing system to avoid altitudes going out of range. Recommended interval is [5 .. 80] m• "All tem files with time stamp later then February 22, 2010 are now written out and modelling with gate open/close times. This implies that the gate opening and gate width times are correct in the geo-file" New Features <ul style="list-style-type: none">• It is now possible to omit a number of gates before inversion of SkyTEM data. The data are not deleted in the processing system, but omitted from the data prepared for inversion.• Now DOI (Depth of Investigation) can be made as elevation in the 'Visualize data and inversions'
21.06.2010	3.3.8.605 WS 58	Corrected bugs <ul style="list-style-type: none">• SCI: Run two configuration file problem corrected
17.06.2010	3.3.7.604 WS 58	New Features <ul style="list-style-type: none">• It is now possible to add a bitmap image to a profile. It can e.g. be a seismic bitmap
14.06.2010	3.3.6.603 WS 55	Corrected bugs <ul style="list-style-type: none">• SCI con files: some parameters have been changed for DOI and forward response con files.• Relative path: relative path are now used for configuration files and inversion.• Batch gridding : combo box selection issue fixed• SCI properties : display of all SCI node properties New Features <ul style="list-style-type: none">• Now it is possible to add interpolated bars to a profile. Use Add DBQ and select interpolated bars• New functionality on the profile form: Show other profiles from a drop down, or use arrows to switch to the profile above or below in the tree.
08.06.2010	3.3.5.602 WS 55	Major update release New features / improved functionality <p>In this release we have concentrated our manpower on stability and speedup but new functionality has also been added.</p>

Profiles

The main focus on the profile revision has been speed but you will also find new functionality.

- Dramatically speedup when re-opening profile's
- First time generation of profiles now much faster
- Speedup when plotting models as bars
- Dynamic point on GIS map
- Increased speed when working with grids
- New copy profile without shifting
- Synchronization between axis and form size
- New 3D grid to make a bitmap of grid cuts
- Visualization of DOI on model basis

SCI

The GUI has been adjusted and made improvements to usability after response from users.

- A drop down has been added to EMBI and SCEMBI allowing to change the number of CPU's used.
- Run 2 now uses run 1 as starting model. This speedup the inversion significantly.
- The inversion parameters can be edited in the new con file editor, see below.
- The Bias inversion parameters can now be modified

Con file editor (advanced inversion settings)

Settings controlling the inversion code (em1dinv) can now be adjusted from inversion setup.

Default settings is "build in" and can be selected for different data types (HEM, TEM, CVES etc.).

Some old configuration files are not used anymore and can be deleted from the em1dinv directory:

```
em1dinv_fast.con
em1dinv_sci_dc_run1.con
em1dinv_sci_dc_run2.con
em1dinv_sci_fem_run1.con
em1dinv_sci_fem_run2.con
em1dinv_sci_tem_doi.con
em1dinv_sci_tem_run1.con
em1dinv_sci_tem_run2.con
em1dinv_standard.con
```

These files are found in the directory:

```
Program files\HGG\Workbench\em1dinv
```

Depth of investigation (DOI)

- User friendly control of DOI settings.
- DOI plotted as elevation instead of depths.

Batch gridding

It is now possible to grid in a batch directly from the DBQ and this new feature can really save time for you.

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The user can select a number of themes and select common settings to use for creating bitmaps for the selected themes.

Inverting for BIAS response in TEM data is now possible but it not documented and you should wait using this feature until a future release.

New themes in “visualize data or inversion’s”

- Resistivity STD
- Thickness STD
- Depth STD
- flight altitude STD
- Inverted bias STD on tab sheet STD
- Inverted bias on tab sheet System (former Pitch Roll tab sheet)

Corrected bugs

- All setting on the "Model Position Explore Settings" form are now saved in the registration database.
- When exporting as XYZ file, the format of the STD values are changed from 0.xx to 1.xx. Furthermore thickness for all layers have been added.
- Standard constraints for smooth and few layer inversion setup added for SCI-inversions. Auto calculation of log. layer distribution for start model added for SCI-inversions.
- SkyTEM import: In case of more than 1000 errors in one line file the log for this line file is truncated so only 1000 errors is shown. An information line is appended.
- The selected models in the model position explorer form are now plotted correctly on the GIS map, also when there two models at the same position/time.
- Pressing cancel Layer Control forced a GIS redraw.
- Problems with color scale engine has been solved: Negative intervals, settings in engine, interval length.
- Adding topography from a DBQ node failed if the models were imported without data in the general model importer.
- The visualization of 2D inversion models and pseudo sections: The triangulation check box had no effect, this has been corrected.
- Fixed a bug that sometimes occurred when adding topography from Surfer grid files (list index out of bounds).
- The Gstat application could now and then return a stack dump error. This has been corrected.
- HEM and GCM import template were not used in the import. The error has been corrected.
- When updating SSV boreholes from a Jupiter database, a BHQ can be selected in order to limit which boreholes will be used, when running a SSV job.
- The forward responses of the real component of all

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frequencies of HEM data are "mirrored" with respect to what they should be. This is not just display, but seems to come from the EMO file itself.

- Added model plot to EMBI
- Implemented the Reverse Cuthill-Mckee (RCM) algorithm for re-ordering models in SCI sections. This re-ordering dramatically lowers memory consumption and inversion time for a future release of em1dinv using a sparse solver.
- A problem with the SCI Setup wizard has been corrected. During data source selection only the setting for the first dataset were actually loaded and could be changed. When another dataset were selected the previous dataset was displayed.
- Elevations on grid nodes is now on exactly three digits forcing correct sort order.
- All data files (tem) with time stamp later then February 22, 2010 are now written with begin and close gate times. Subsequent the finite gate width is modelled in the inversion code.

03.05.2010 3.3.4.601 **Maintenance Release**

Bugfixes

1. Update of em1dinv due to a bug affecting the HEM responses

25.03.2010 3.3.3.599 **Maintenance Release**

Bugfixes

2. Problems with resubmission of SCI inversions has been fixed.
3. EMBI could go idle for very long time resulting in very long execution times.

09.03.2010 3.3.2.598 **Maintenance Release**

Bugfixes

1. Redefining start models in "Use inversion results as starting models" followed by a resubmit of the models caused an error.

08.03.2010 3.3.1.597 **Update Release**

New Features

1. The SCI is now controlled via a wizard. A-priori information can be added prior to inversion from conductivity logs, GIS and Workbench interface files.
2. em1Dinv now support DOI – Depth of investigation

25.02.2010 3.2.66.596 **Update Release**

New Features

1. It is now omitted to activate a processing node of the sounding points just is needed for plotting on the GIS. If the processing layer exists in the GIS the layer is just shown. To be able to refresh a layer if e.g. the sounding distance has changed a Refresh function is implemented on the node. The refresh recreates the GIS layer.
2. A function has been added to the SkyTEM edit window allowing to automatically delete raw data soundings if the flight height is above a certain flight height.
3. A functionality has been added to the SkyTEM edit window allowing to delete soundings one a channel if they are deleted on another

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channel.

Bugfixes

4. The SCI functionality and GUI has thoughtfully been updated, debugged and tested.

05.01.2010 3.2.63.591 **Maintenance Release**

Bugfixes

1. New em1dinv executables. An "out of bounds" access violation occurring with TEM-data has been fixed

27.11.2009 3.2.62.590 **Maintenance Release**

Bugfixes

1. Coordinate system selector now initializes correctly, e.g. when importing SkyTEM data
2. When opening shape files they are now by default converted to WGS84 lat/long. This seems to work in all cases. Netherlands National System added as a coordinate system.
3. em1dinv: An error check has been added so that em1dinv now gives a meaning full error if the time distance between the front gate and the end of the ramp is smaller than $1.e-7$ s (0.1 micro sec).
4. An error in the model position explorer window prevented the use for showing inversion results.

18.11.2009 3.2.61.588 **Maintenance Release**

Bugfixes

1. em1dinv:
An error check has been added so that em1dinv now gives a meaning full error if the time distance between the front gate and the end of the ramp is smaller than $1.e-7$ s (0.1 microsecond).
2. If you try to do a auto clay calculation for SSV and the GEUS.DLL is missing, an error dialog appears, from where help can be opened.
3. Fixed a bug where manual altitude edits outside the data interval would cause an access violation.
4. Fixed a coordinate transform bug prevented the auto center map functionality to work properly when data and map were different coordinate systems
5. Visualize inversion is now implemented for PACES data
Visualize data or inversion can now be called from all relevant nodes in the workbench manager, i.e. the tree
6. The topography is now by default calculated from the difference between the GPS measured altitude and the laser measured altitude. The laser altitude is based on pitch and tilt corrected altitudes averaged over all lasers and located to the center of the frame. The topography is overwritten if a topography grid is added at a later stage in the processing sequence.
7. Fixed a bug, that sometimes made 'Visualize data or inversions' for e.g. altitude not work properly.
8. The altitude measured by the GPS is now read from the SPS file, saved to GERDA and processed using the GPS processor settings. Furthermore, it is displayed in the SkyTEM edit window under the GPS item. Here it can be shown as either GPS altitude or GPS elevation.
9. Fixed a bug, that sometimes made 'Visualize data or inversions' for e.g. altitude not work properly.
10. It is now possible to run only the processing algorithms on only one SkyTEM channel at a time.
11. A new feature in the SkyTEM processing s system enables the user to

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rerun the processors and keep the raw data processing.

12. A new functionality has been added enabling the user to easily apply a standard deviation (STD) to SkyTEM raw normalized data. The STD is dependent on the signal level and it is specified as a function of software channel number and gate number.

The new functionality will be released in the forthcoming Workbench service release.

13. Current was not calculated when using narrow averaging for SLM and LM.
14. The inversion system can now be loaded directly from a DBQ node. This is extremely useful when used together with the now model importer for evaluation of inversions carried out in third party software like EMFlow.
15. The new color scale editor has been disabled due to compatibility problems.

03.11.2009 3.2.60.587 Maintenance Release

Bugfixes

1. The topography is now by default calculated from the difference between the GPS measured altitude and the laser measured altitude. The laser altitude is based on pitch and tilt corrected altitudes averaged over all lasers and located to the center of the frame. The topography is overwritten if a topography grid is added at a later stage in the processing sequence.
2. Fixed a bug, that sometimes made 'Visualize data or inversions' for e.g. altitude not work properly

30.10.2009 3.2.59.586 Maintenance Release

Bugfixes

1. Fixed a bug that would sometimes cause the Workbench to freeze when loading models or indexing a new SCI.
2. A bug where embi reports that the emo file from the inversion program is incomplete, has been fixed. The bug is caused by the new compiler used to compile the inversion program

30.10.2009 3.2.59.585 Maintenance Release

Bugfixes

1. When determine the minimum number of gates for a sounding only in gates which are in use after the average filters are counted. Minimum number of gates per sounding
2. Strange error message, Danish XP (Out of disk space was translated to: Printerens løbet tør for papir)
3. For single layer model, blind last layer is skipped.
4. SkyTEM aps delivers often skb files which have the Moment.ini version set to 1 even though the version should be 2. The importer now wraps this by forcing the version number to 2 if the skb is created in 2009 or later.
5. Several bugs in the implementation of the new 2nd order filters have been fixed. Also new default settings for the Slope Min and Max are added as -0.5 and 0.5, respectively.
6. A check box for x receiver coil present has been added in the add survey info for SkyTEM. Further checks for correct settings have also been added for SkyTEM.
7. Fixed a bug that could cause the error message "Data mapping inconsistency error in TinINITGModel.InitTGODVFWRes" in Embi when inverting HEM data for selected frequencies only.
8. For SkyTEM data channels measured without front gate a bug has been fixed preventing this information to be used in the inversion.

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9. Number of decimals were not correct in mod file
10. Configuration file in updates corrected.
11. TXD lines with undefined values could not be read from SPS files.
12. Old color scale editor can be reached from color scale bar with right click
13. Missing Jupiter97.md# added to installer
14. Color scale related changes:
 - Selector design change + ignore errors in .lvl files
 - LVL write error
 - Always prompt for file name when finish
 - Profiles now use new editor

12.10.2009 3.2.58.584 **Maintenance Release**

Bugfixes

1. SCI – Indexing could not start on some systems.
2. Color scale – colors flipped in map data to color scale.

07.10.2009 3.2.57.583 **Maintenance Release**

Bugfixes

1. Worspace template update

05.10.2009 3.2.56.582 **Update Release**

New Features

1. SCI – New module for Spatially Constrained Inversion that produces quasi-3D conductivity modeling of electromagnetic (EM) data using a 1D forward solution.
2. Themes for quality control.
From the map level 'Visualize Data or Inversions' can be called. For now only the inversion part is implemented. You can create point or grid themes based on SkyTEM or SCI inversion nodes, e.g. Flight altitude, Flight altitude difference, data residual, resistivity, ...
3. Color Scales – A new editor for editing color scales has been developed. New standard color scales has also been added.

Updated

1. Final report pages – The module has been updated / bug fixed according to user input.
2. Production line editor - The Production Line Editor has been totally rewritten and redesigned, making it more stable, and much easier to use.
The new tree view style gives a perfect overview of the lines and points, and almost all control of the lines is managed by right-clicking the tree view.

24.06.2009 3.1.55.581 **Maintenance Release**

Bugfixes

1. Survey info: PARTY can contain empty records (GEUS error). Now for both Access and Firebird db's.
2. SSV: Removes directory after run job

22.06.2009 3.1.54.580 **Maintenance Release**

Bugfixes

1. Survey info: PARTY can contain empty records (GEUS error)
2. Not initialized data sets could cause errors when data was shown

16.06.2009 3.1.53.579 **Update Release**

New Feature

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The SSV module has been revisited and many new features has been added:

- Add boreholes to new or existing Jupiter, from GUI or from files
- Merge Jupiter boreholes to SSV node
- Borehole editor has been extended with new features:
 - new fields
 - integration with GIS
 - filtering
- Automatic estimation of clay thickness in the borehole editor
- Revision off the SSV job submitter
- The themes has been expanded extensively

Important note - for SSV only!

The new version is not backward compatible with previous versions of the Workbench.

Update Release

The new em1dinv version has a fast 64bit engine to be used on 64bit version of Windows. Optimizations of the code have made it more than twice as fast as older version.

Bugfixes

1. Labels shown on the GIS for profile layers
2. When adding layers to a profile node the layer can now not be added if it has no models or boreholes in it. In this case an information dialog is shown. If the layers are added from a profile node, no information dialog is shown and the layer is not added.
3. Fixed an error that followed general model import, new dbq and show inversion results. This could have occurred in other situations using com g add methods.
4. An index out of range bug has been fixed with the new second order filters for SkyTEM.
5. Any read errors of skb files are now listed in the Workspace log viewer.
6. Fixed a bug causing an exception when adding a geometry file where one or all of the software channels had no front gate defined.
7. A new setting has been added to the SkyTEM data processing list allowing defining channels as being noise. When a channel is defined as noise the current is set to 1A which makes it possible to display average noise data in the edit form. TEM files for the inversion system can not be written for channels defined as noise.
8. Sign check during import was not shown correctly.
9. GPA altitude is now imported and can be shown in the SkyTEM edit window.

16.06.2009 3.1.52.579 **Update Release**

New Feature

The SSV module has been revisited and many new features has been added:

- Add boreholes to new or existing Jupiter, from GUI or from files
- Merge Jupiter boreholes to SSV node
- Borehole editor has been extended with new features:
 - new fields
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Aarhus Workbench release history

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Update Release

The new em1dinv version has a fast 64bit engine to be used on 64bit version of Windows.

Bugfixes

1. Labels shown on the GIS for profile layers
2. When adding layers to a profile node the layer can now not be added if it has no models or boreholes in it. In this case an information dialog is shown. If the layers are added from a profile node, no information dialog is shown and the layer is not added.
3. Fixed an error that followed general model import, new dbq and show inversion results.
4. This could have occurred in other situations using com g add methods.
5. An index out of range bug has been fixed with the new second order filters for SkyTEM.
6. Any read errors of skb files are now listed in the Workspace log viewer.
7. Fixed a bug causing an exception when adding a geometry file where one or all of the software channels had no frontgate defined.
8. Average noise data. A new setting has been added to the SkyTEM data processing list allowing defining channels as being noise. When a channel is defined as noise the current is set to 1A which makes it possible to display average noise data in the edit form. TEM files for the inversion system can not be written for channels defined as noise.
9. SkyTEM import: Sign check did not work (read Color error)

16.04.2009 3.1.52.578 **Maintenance Release**

Bugfixes

1. Initialization error in the SkyTEM processing system prevents saving files for the inversion

01.04.2009 3.1.51.577 **Maintenance Release**

New Feature

Now it is possible to "shade" a bitmap theme. The bitmap theme, e.g. mean resistivity, can be shaded as if it was a landscape seen in sunshine. The sun angle can be set by the user. The shading tool is implemented in "Create Theme".

General

1. When an exception occurs, a file with settings for the registry database is dumped in the workspace directory. The user is asked to attach the file to the e-mail reporting the bug.
2. The Borehole Database has been extended with new fields and a new table.

Bugfixes

3. The New Workspace dialog has been adjusted, so it doesn't show files, but only folders and shares.
4. A bug sometimes resulting a range check error when "showing inversion result" has been fixed
5. Show Bitmap Themes Form now resizes the bitmap, when form is resized
6. Now the coordinate system selector remembers position on screen

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- and last chosen coordinate system
7. Apriori STD on flight altitude was not written to the model file. Fixed.

SkyTem

8. When keeping the raw processings all selected channels are processed and average user flags are reset.
9. It is now possible to connect to a GERDA database and restore the SkyTEM dataset and processing nodes.

04.03.2009 3.1.50.575 **Maintenance Release**

Bugfixes

1. A new feature in the SkyTEM processing s system enables the user to rerun the processors and keep the raw data processings.
2. Bug fixed, which made it impossible to upgrade workspace.
3. If no license or dongle for SiTEM and Semdi is found, a message is shown, and program can not run
4. Bug regarding log kriging has been fixed.
5. Fixed a bug that would sometimes cause an exception when adding survey information.
6. A range check error sometimes occur, when you try to import new data into a workspace. The bug has been fixed.
7. The translucency setting on the Bitmap Properties form is now remembered, when form is re-opened
8. Form "Copy and Shift Profile" now remebers last position, when re-opened.

02.03.2009 3.1.50.574 **Maintenance Release**

1. License file to em1dinv updated

06.02.2009 3.1.50.571 **Maintenance Release**

Bugfixes

1. A new functionality has been added enabling the user to easy apply a standard deviation (STD) to SkyTEM raw normalized data. The STD is dependent on the signal level and it is specified as a function of software channel number and gate number.
2. A bug that would sometimes cause an exception when saving SkyTEM processing settings has been fixed.
3. The value of "Autoscroll Interval" in "Model Position Explorer Settings" form is now remembered, when form is re-opened.
4. No current was calculated when using narrow averring for SLM and LM. This has been fixed.
5. Progress bar on data import (HEM and GCM) has been improved
6. Data and forward response files can now be exported from HEM inversion nodes.
7. CVES-explorer: Name changed from CVES to DC. DC Explorer now remembers position. Print added to right click menu for the three plot forms.
8. Correct information is now shown, when not connected to the interned.
9. Filter function added to dialog "Zoom to layer" (opened if right clicked on GIS map)
10. Some more fields are added to the tab file created for the HEM dataset node. The field are: LineNumber, LineType, FID, BirdAltitude, Elevation, Dataset and Position
11. Now the setting for Triangulated Interpolation is remembered, and shown when form is re-opened.
12. When the user deactivates a SkyTEM processing node he is asked if

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he want's to save or not.

13. Fixed a bug that would sometimes cause an exception when upgrading old workspaces(Tgsidm.GetColorscale error message.)
14. The GUI of General Model Importer has been polished
15. Import extra 60 sec. of navigation data where data has been mask out. This gives better alt fit, topo. fit etc.
16. Profile coordinates are now re-calculated on the fly such that they start from 0 when inspecting single lines in the inversion explorer.
17. When resubmitting just a selection only the necessary hem.-files are written
18. When importing SkyTEM data, the Check for, whether a flight line crosses midnight, has been removed.

20.01.2009 3.1.48.570 **Maintenance Release**

Bugfixes

1. Workspace db version now 44

19.01.2009 3.1.48.569 **Update Release**

General

1. New feature: Create Final Report Pages
A new feature to make maps ready for print is included in this release. With the new feature you can build a template ready for printing with logos, color-bars, scale-bars, legends etc. In the main window of your canvas you can then put thematic maps or sections, creating PDF's ready for reports and other printed material.

Bugfixes

19. Resolved an inconsistency when joining many inversionsnodes to a single export.
20. Fixed a bug that prevented CVS rhoa in-use flags from being saved when IP data was present but never shown.
21. Fixed a bug that caused the following exception when showing the inversion result from a CVES inversion with single model sections :
:"The number of datapoints differ from the number of sequences in TpioModel1DCVS.SetSequence".
22. The error message raised when opening a profile plot and there are no boreholes within the projection distance has been removed.

SkyTEM

2. A new functionality has been added enabling the user to easy apply a standard deviation (STD) to SkyTEM raw normalized data. The STD is dependent on the signal level and it is specified as a function of software channel number and gate number.
3. A bug preventing current to be calculated when using narrow averaging for SLM and LM has been fixed. The current is now written to the tem file in all cases (average and raw).

22.09.2008 3.1.48.568 **Maintenance Release.**

General

1. New feature: Import of general models
A new feature to import models from any airborne system has been implemented. The importer will take in any column-based files holding information on a layered model. Optional you can supply also the observed data and forward data of the inverted model. Doing this you have access to the data curves and fits via the GIS interface.Optimized Import of models. Both EMBI and

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- import of models now runs significantly faster.
2. The model load queries are now opened in parallel. This improves the load times significantly on multi cpu systems. Updated the database engine for the inversion explorer and the model export system. This removes the present limit of ~60000 models pr. inversion node. **Access databases, however, are no longer supported.**
 3. The inversion system can now be loaded directly from an DBQ node. This is extremely useful when used together with the new model importer for evaluation of inversions carried out in third party software like EMFlow.
 4. If an exception occurs, the user will be offered to send an email to bugreport. The bug message and version number is automatically included in the mail. Details about the problem should be added before sending the email.
 5. In windows where users select directories, one can now navigate with the arrows on the keyboard.

Bug fixes

1. The last line in tem files were in some cases not written. This has been fixed
2. Fixed a bug that would sometimes discard part of the models when resubmitting SkyTEM data with line number information.
3. Altitudes were not written correctly to the tem files when exporting after processing and NOT pressing save or update edits from the processing system. The bug was introduced in the June 2008 release of the workbench. It is fixed now.
4. Fixed a bug that prevented the display forms in the inversion system from updating after changing starting models.
5. Sentinel Key Driver is updated. Wait time is increased in installer wait loop for correct installation on laptops and older computers.
6. Fixing an initialization error that would sometimes throw the following exception when importing PACES data: "An error occurred while writing data to the PAMA table".

07.08.2008 3.1.47.567 **Maintenance Release**

Bug fixes

1. Fixed a +1 STD error in the inversion visualization system. This bug was introduced in version 3.1.46.566.
2. A bug which could cause the wrong processing data to be assigned for the GPS, tilt and altitude processors when first running the processing with all devices and then only with device 2 or 3 has been fixed. The data are now removed from the database before starting the processing.

06.08.2008 3.1.46.566 **Maintenance Release.**

General

1. Fixing an initialization error that would sometimes throw the following exception when importing PACES data: "An error occurred while writing data to the PAMA table".
2. The following coordinate systems have been implemented and tested:
3. British National Grid - EPSG=27700
4. Irish Transverse Mercator Grid - EPSG=29900.
5. The Show/Hide menu item for SkyTEM nodes is now working the same way as for all other nodes in the Workspace Manager.
6. To increase the productivity when using the SkyTEM module nodes are now automatically activated when data are e.g. re-processed, plotted or inverted.
7. A check has been made to prevent SPS data with a time stamp

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before the year 2000 to be imported.

Bug fixes

1. Fixed an access violation introduced in version 3.1.45.565 when exporting tem files.
2. Fixed a bug to prevent NaN to be written to the inversion program when data are inverted with a uniform standard deviation only.
3. Import of selected SkyTEM channels was not working when doing stack division. This has been fixed.
4. Fixed a bug that would sometimes cause a division by zero error when working with HEM datasets with negative data points.
5. Fixed an out of range error when trying to make an interval resistivity theme including 1 layer models.
6. It is now possible to add topography to a DBQ node created directly from a SkyTEM inversion node(s). All the Add Topography menu item appears now in the DBQ node right click menu.

07.07.2008 3.1.45.565 **Maintenance Release.**

1. A bug introduced when fixing a bug in version 3.1.43.563 concerning narrow average filters has been fixed. This only relates to processing nodes created in older versions.

01.07.2008 3.1.44.564 **Maintenance Release.**

General

1. Added support for new coordinate systems.

Bug fixes

2. Changed starting position of the gridding progressbar.
3. Minimum number of datapoints for HEM inversion now counts over data components in-use instead of frequencies.
4. Labels on point themes are now shown as floating point values instead of integers.
5. Added autocenter map functionality to the inversion system for datatypes HEM,GCM, PACES and CVS.
6. Added more information to the GIS info tool for HEM data.
7. Other minor bugs in the inversion system.

13.06.2008 3.1.43.563 **Update Release.**

General

1. A new importer has been implemented for the GCM-module and new modes are added. Data can enter as Real/Quad (ppm), Rhoa/Phase or Quad (ms/m)/Real (ppt)
2. Optimized writing of TEM and CVES/PACES data files.
3. Transmitter current can now be displayed on the SkyTEM processing form.

Bug Fixes

1. Fixed a bug that prevented creation of themes from DBQ's including 1 layer models
2. Post-processing from the 2D CVS inversion system is now correctly synchronized with the processing.
3. In cases where average soundings were created using a very narrow average filter the average sounding position were rejected. In the design of the averaging method it was required that the first gate could be created with a raw gate both to the left and to the right. In case this was not possible no sounding was created. This check has now been removed.
4. Fixed an error that prevented creation of contour profile plots.
5. The SkyTEM processing is now automatically saved in the

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- database after 1st run of the processing.
6. Fixed a bug that could raise the exception message "An unknown error has occurred in TcomMapForm.ComViewData. Please report this problem" when trying to inspect a DBQ model from the GIS.
 7. Several optimizations in the inversion position explorer. The inversion visualization system is now able to hold a huge amount of models without performance penalty.
 8. Fixed a bug that would sometime raise the exception "GSTAT error 1, null" when gridding data.
 9. Fixed a bug that could cause large SSV runs to crash.
 10. Fixed a scaling error when generating advanced variograms.
 11. Fixed a point theme coordinate system transformation error.

24.04.2008 3.1.42.562 **Maintenance Release.**

1. Fixed a problem that prevented upgrading SSV workspaces correctly.
2. When creating a new GERDA the user is no longer prompted to select database type. All new databases are now Firebirds.
3. Optimized the SkyTEM forward data loading query. Optimized fetching of model data from the database.
4. Fixed an error introduced in version 3.1.41.561 which would sometimes add 1 to the displayed STD when inspecting data from profiles or the GIS map.
5. Minor changes to the new HEM importer.

04.04.2008 3.1.41.561 **Maintenance Release**

1. Added topography support to the new HEM importer.
2. Added new and more intuitive import menu.
3. Other minor HEM related bug fixes.

02.04.2008 3.1.40.560 **Update Release**

General

1. Nodes are now always selected after an operation has been carried out from the Workspace manager.
2. Fixed a bug where resistivities < 0.05 ohm-m would be rounded down to zero during ascii export of LCI models
3. A progress bar has been added when writing the hem and model files to disk before inversion
4. When checking or de-checking a node in the Workspace manager the node and sub nodes are no longer expanded.
5. The paradox file pdxusers.net is no longer located on the c:\ directory but in the users Temp directory.
6. In-loop (co-incident loop) TEM data supported on import
7. Several changes has been made to the IP processing system in order to improve the workflow.
8. The data residual calculated now matches the one calculated in em1dinv. The difference was that the Workbench used log10 and em1dinv uses ln.
9. Fixed a bug that prevented inversion of single model sections in fast mode.
10. Fixed a range check error when using "Filled" view on the model section form in the inversion system
11. The GIS tools now show up correctly when selected from the main menu. Added the pan tool to the map right click menu.
12. Chart tools on the main menu are now synchronized with the pop-up chart tools.
13. Fixed a bug that caused bitmaps to appear rotated with respect to

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the data when working with multiple local coordinate systems and their transformations involve different rotations.

14. Updated Proj4 definition files. The Gauss-Krüger projection is now handled correctly.
15. Survey info is now added correctly to ground based TEM surveys.
16. MODEL.INTPDATE is now filled when importing RES2DINV results.
17. Several optimizations made in the model1D loader. This speeds up the model 1D load queries, especially for airborne data.

HEM

1. The HEM module now has full support for horizontal dipoles
2. Models can now be exported from HEM inversion nodes.
3. Added support for line number filtering of HEM data in the inversion system.
4. Node names are now shown in the form captions of the inversion system for HEM data.
5. Enabled editing of point display properties of HEM data nodes.
6. Data residuals for HEM are now calculated correctly
7. Added "inverted altitude" as an available display column on the Model Position Explorer form for HEM data.
8. Models are now actually deleted from the database when deleting a HEM inversion node.
9. The FEM inversion settings form now remembers the previous selected frequencies

SkyTEM

1. When calculating the position of a SkyTEM sounding the UTM and elevation positions are now interpolated instead of just picking the nearest UTM and elevation position. This did not cause significant round off errors when the flight speed was low, but the change is necessary with high flight speed.
2. Flip sign functionality added to the Multiply and Shift Gates window.
3. The SkyTEM processing window has been partly redesigned to give the user a better overview
4. It is now possible to hide the data series navigation panel at the SkyTEM processing window. This feature gives more space to show the data curves when doing manual processing.
5. The user can now decide if he wants raw soundings on both left and right side of an average soundings with in the average interval. because of backward compatibility this settings is default ON but should in all new projects be left OFF.
6. A channel description has been added to the Channel list display in the SkyTEM processing window. Furthermore, the window itself has been made re-sizable for better display of the channel descriptions.
7. The processing check box is now automatic enabled when double clicking a software channel in the processing window
8. A check for data with a value of zero has been added to the procedure which tries to spot capacitive couplings. Zero value is sometimes on very noisy data.
9. An extra check has been added to the SkyTEM Cap Sign filter functionality preventing it to raise an division by zero exception
10. The window used to plot sounding curves in the SkyTEM system now remembers its sizes also without pressing one of the data transform buttons.
11. The Apply New Geometry File functionality has been relocated from the SkyTEM processing node to the dataset node. Also the processing node does no longer has to be active before use.
12. Added X receiver coil for skyTEM survey info.
13. The program has been optimized so it runs more smooth when

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using the Set Buffer window to change the buffer position. If the buffer size is changed the program still need to recalculate the plot which might take a few seconds if working with large datasets.

14. The SkyTEM edit window has been redesigned with new and more informative buttons
15. A new item in the SkyTEM voltage data processing settings has been added. The item is "Trapez Synchronized location of soundings" or "Trapez Sync. location of sound.". Using this function ensures that sounding locations across software channels have the same location in both time and in coordinates (if they have the same sounding distance).
16. Altitudes are now ALWAYS set the "a-priori altitude if not recorded" value when exporting TEM files for inversion
17. The import counter for SkyTEM data now shows the correct number of steps.

18.02.2008 3.0.39.559 **Maintenance Release**

1. MODEL.IDENT is now correctly formatted when adding survey info.
2. Fixed an out of bounds error when adding survey info.
3. Fixed an out of bounds error in the IP processing system.
4. A number of dialogs has been added to give a better flow when processing SkyTEM data. After creating a SkyTEM dataset node the user is prompted if he also wants to create a processing now right away. After processing the user is also prompted if he wants to show the SkyTEM processing window.
5. It is now checked that SkyTEM data has actually changed and therefore needs to be saved to GERDA when deactivating a SkyTEM processing node. Also, after the automatic processing the user now does not have to wait for the program to save the data. The makes the system much more smooth to use. Finally, the user is not asked to save to GERDA when the editing form is closed.

08.02.2008 3.0.38.558 **Maintenance Release**

1. Fixed a bug related to adding survey info to Access databases.
2. Fixed a bug that would sometimes cause an exception when inverting CVS data with negative data points in the processing.
3. Fixed a profile display bug introduced in version 3.0.37.557.

01.02.2008 3.0.37.557 **Maintenance Release**

4. Updated version of em1divn.
5. The CVS importers now mark negative data points permanently in use instead of discarding them.
6. CVS processing system updated to allow display of negative data points.
7. Fixed a bug in the CVS processing system that showed all points in use, even though both raw data and processed data had been imported.
8. Fixed an access violation in the inversion system when working with line numbers larger than 255.
9. Several minor bug fixes in the line number function in the skyTEM importer.
10. Fixed a range check error when resubmitting CVS data.
11. Model export format significantly expanded.
12. A new item in the SkyTEM voltage data processing settings has been added. The item is "Trapez Synchronized location of soundings" or "Trapez Sync. location of sound.". Using this function ensures that sounding locations across software channels have the same location in both time and in coordinates

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(if they have the same sounding distance).

13. Several changes and bug fixes in the SkyTEM production line editor.
14. A channel description has been added to the Channel list display in the processing window. Furthermore, the window itself has been made re-sizable for better display of the channel descriptions.
15. Section size 300 added to the automatic inversion setup form.
16. Fixed an error when adding grids to profiles.
17. Fixed a bug with the nugget and spherical fit function in the new grid module.
18. Several minor bug fixes in the set survey info system.
19. Several minor bug fixes in the SkyTEM processing system.

15.01.2008 3.0.36.556 **Maintenance Release**

1. Fixed a bug introduced in version 3.0.34.554 which produced the wrong cell sizes for RES2DINV inversions when some electrodes were not actually in use.
2. Fixed a bug that produced an out of memory error when trying to import skyTEM data with line numbers higher than 255.
3. Adding survey info now also affects any 2D models.
4. Added UTM coordinates to data/forward data export files.
5. Fixed a bug that prevented DBQ's from being added to Geoscene3D nodes.
6. Fixed a bug that caused an exception when trying to add a grid to a profile.
7. Fixed default value errors when moving up from 1 model layer on the manual inversion job form.

17.12.2007 3.0.35.555 **Maintenance Release**

1. Disabled masking in the gridding module.

14.12.2007 3.0.34.554 **Maintenance Release**

1. Several bugs fixed in the IP processing/inversion system. Half cell width inversion has also been enabled.
2. Updated version of em1dinv and GERDA templates.
3. Fixed a bug that would cause the Workbench to raise exceptions when losing a wireless connection.
4. Minor changes to the SkyTEM production editor.
5. Other minor bugs fixed.

07.12.2007 3.0.33.553 **Engine Update and GIS component upgrade**

1. The data base server had been updated. The new server is uses multiple processors thereby greatly enhancing database access time
2. A new version of the MapX component has been included. This among other things supports transparent bitmap images
3. The compiler has been updated. The update has given an overall performance increase of a factor of 1.5.

IP Module

The CVES module has been extended so that it now includes a fully integrated IP module, for processing and inversion of datasets containing IP data.

Gridding Module

The gridding module has been totally rewritten making it both more stable and intuitive to use.

General Model Importer

A General Model Importer has been implemented. Using this virtually any

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kind of data that can be written in a column ASCII format can be imported.

SkyTEM Line files

Added SkyTEM line files. When used during import data are masked and line numbers assigned. These are carried through all the way to the inversion system. Line files can also be created with the Aarhus Workbench with the new SkyTEM Production File Editor.

Various enhancements

1. Both automatic and user defined color scales are now available in the RES2DINV viewer
2. Coordinate transformation has been changed to a two step process: Source->Lat/Long->Destination. This two step procedure fixes transformation errors for some coordinate systems, e.g. ED50. The code has also been optimized so coordinate system transformation, even for large datasets, is performed at virtually no penalty
3. All data points is converted to the coordinate system of the map. This has solved numerous problems with different coordinate systems which is well handled by the GIS component.
4. Altitudes can now be plotted on an elevation scale in the 1D-LCI inversion system
5. Added name to the all forms in Res2Dinv and 1-D LCI Inversion
6. A new non-spike filter for has been implemented when forming average SkyTEM soundings
7. The automatic inversion form now remembers individual settings for all data types and smooth/layered mode
8. Default altitudes for missing altitude data is controlled by the user in the inversion setup
9. Added new tab to the Inspect Starting Model form. This new tab displays the actual starting models used for the inversion
10. Added a dialog which prompts the user whether to re-load the models when opening a previously opened inversion node
11. Default appearance of series in the SkyTEM Edit Form has been optimized
12. The CVS importer now checks for integer multiplier/divider relationship between the connector separation and the UTM coordinates. If this is found, the user is prompted whether to apply the correction
13. The Access workspace format is no longer supported. These workspaces are automatically converted to Firebird format.
14. New module licensing system.
15. Numerous enhancements to the HEM inversion system.

Bug Fixes

1. Fixed a bug that occurred when adding survey info for newly created GERDA idents
2. Fixed an error where survey info would not be added to all tables in GERDA
3. Fixed a bug that would sometimes prevent databases from being recognized when opening a workspace
4. Fixed a bug that occurred when plotting the Positions series in the SkyTEM processing system
5. Fixed a bug that prevented first line of ASCII DEM file to be set as header line
6. Fixed a bug that occurred when plotting the Positions series in the SkyTEM processing system
7. Fixed an error when trying to print without having set the resolution
8. Fixed a print settings bug, which could sometimes cause an exception when printing

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9. Fixed an error that would occur when the user aborted the creation of a Geoscene3D node
10. Fixed an error in the SkyTEM Edit Form that occurred when using the Select Between Lines tool
11. Fixed an indexing bug in the CVS resubmission system, which would sometimes cause the wrong models to be resubmitted
12. Tilt sign for SkyTEM models corrected in the inversion visualization system
13. Fixed an error that would occur when creating/connecting to databases with Danish characters in the name
14. Fixed an error that would occur when closing the SkyTEM Edit Form with Sounding Plots open
15. Added epsg to inversion nodes for all data types, except SkyTEM where it was added earlier
16. Fixed a bug concerning where the drop down boxes in the SkyTEM processing system would stop working if Default button was pressed
17. Problem with Edit Display for the SkyTEM processing position marker on the GIS MAP is fixed
18. The SkyTEM select GIS tool now works on the first click. A warning is given if other than SkyTEM processing points on the GIS-map are selected with the Select SkyTEM tool
19. And many more.....

05.09.2007 2.3.32.552 **Bug fixes and enhancements.**

1. A bug causing coordinates to be slightly shifted in the Y-direction when converting a large number of coordinates has been fixed.
2. Added no. data points in use to the statistics form in the CVES processing system.
3. Connecting to a database with Danish characters in the filename caused a database server error. This is no longer permitted.
4. Fixed an indexing bug in the CVES resubmission system, which would sometimes cause the wrong models to be resubmitted.
5. Properties can now be inspected on RES2DINV inversion nodes.
6. A new non-spike filter has been implemented for average SkyTEM soundings. The new filter efficiently removes spikes by first sorting the gates in a stack, then removing the smallest and the largest values and then averaging the rest. The data standard deviation is calculated from the non-spike filtered stack. The number of data to be removed is set in percent. If e.g. 20 % is set, 10% of the data are removed from the low end and 10% from the high end.
7. Default altitude for SkyTEM data with missing altitude information is now user definable.

06.07.2007 2.3.32.551 **Bug fixes**

1. Theme maps, data etc. from the Workspace manager are now exported in the coordinate system of the GIS-map.
2. New default axes on the variogram editor for an improved view
3. When using the unfitted filter in the inversion system on skyTEM data, the updated in-use flags are now correctly saved to the processing.
4. Several short cut keyboard-operations have been defined for the SkyTEM module (see help for detailed description)
5. Added epsg to inversionnodes for all datatypes, except skyTEM. For skyTEM it was implemented november 2006.
6. Optimized compiler directives for all bpl's before release.
7. Added exception handling in Embi relating to the data-time stamp
8. The automatic inversion form now remembers individual settings for all datatypes and smooth/layered mode.
9. Documentation of Skb file added in form of file example with descriptions. Not a perfect way of doing it but anything else seems

impossible.

10. Import bug on the 3rd tilt-device on SkyTEM data has been fixed
11. Enhanced control of tilt and altitude settings added to the inversion of Airborne data.

29.06.2007 2.3.32.550

New 3D module with GeoScene3D

1. A new module for 3D visualization using the program GeoScene3D has been implemented. Using GeoScene3D together with the Aarhus Workbench allows for 3D views of most themes created within the Aarhus Workbench (e.g. draping of an interval resistivity map to a topographical surface or showing the depth to a good conductor as a 3D image together with the topographical information)

New module for Helicopter EM data (HEM)

1. A new module for inversion HEM data has been implemented. The inversion features full support for both few-layered and smooth 1D inversions. With automatic settings only a few clicks are needed to get to the inversion results. The system will handle even very large surveys due to automatic sub-sectioning of the data.

New visualization tools for inversion results

1. Two new visualization tools have been added to the Inversion Explorer ("Show Inversion Result"); 1) A Data profile plot showing the observed data as errorbars and the datafit as a connected line enabling direct evaluation of the datafit and 2) a model analysis plot showing the parameter analyses as bars for each model. Each parameter (layer resistivities, thicknesses and depths to layers) is represented with a colored bar for easy evaluation of all parameters.
2. A Center Map function has been added to the 1-D LCI inversion evaluation system.

Support for IP data

1. IP data measured with multi-channel equipment are now fully supported. Integral IP as well as full time-decays are read from an extended dat-file in RES2DINV-format. Pseudo-sections of individual time decays are displayed as well as the integral IP value. Advanced processing features are connected to this system.

New PACES inversion module

1. PACES data can now be inverted in the general inversion system. As for HEM data both smooth and few-layered models are supported in both an automatic and manual mode.

Various enhancements

1. A general feature for handling Digital Elevation Models (DEM) has been added. From a large DEM smaller grids can be made directly with the mouse.
2. The GIS-tools and Chart-tools have been moved to the main program menu for easy accessibility.
3. The data to map coordinate transformation have been optimized to work also in very extreme cases.
4. The Auto inversion window now remembers settings differentiated to the data types and to the model type (smooth/layered)
5. The in-use flags on inversions results have been synchronized with the processing which means that changes applied from the inversion system can be saved to the processing.
6. Survey Info is now optional for all data types and the Set Survey Info menu item is renamed to Add Survey Info
7. Import of data is now available from right click menu for GERDA-databases
8. Scaled prints are now available from all charts in the Aarhus Workbench. Charts that involve a length axis can be printed to a

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selected horizontal scale (e.g. 1:5000) and a connected vertical exaggeration.

9. The minimum height of colorscales have been made smaller.
10. New workspaces can now only be created in Firebird format.

SkyTEM module, enhancements

1. The help system for import of SkyTEM data has been greatly updated
2. More than one tilt device is now supported in the processing system. A few range check errors has been fixed when calculating the average of more than one tilt device.
3. Binary files with errors are read until the error occurs - then the rest of the file is skipped
4. Added the possibility of viewing Helicopter speed and topography series to the skyTEM processing system"

SkyTEM module, bug fixes

1. A bug has been fixed preventing activation of a processing node where where only one tilt or altitude device has been processed.
2. Added descriptive error message when the production file has format errors.
3. Rhoa and dbdt plots now restore it's window size on the screen depending on if the window plots Rhoa or dbdt.
4. A check has been made to make it possible to process and plot data even when there are no altitude data in the dataset
5. A check prevented the processing system to continue when voltage data was not present in the database. The cahck has been removed and e.g. altitude data can now be processed without voltage data.
6. A check preventing from time to always be smaller than to time when creating a new processing was not implemented correct and could prevent the time to pass midnight.
7. Old code used to import tem files just after exporting has been removed as it accidentally could be initiated without the knowledge of the user.
8. Adding topography to SkyTEM datasets caused and error when transforming coordinates because some coordinates could be not defined (NaN). This has been fixed by skipping these coordinates
9. It is now checked that SkyTEM data only can be imported to a Firebird database.
10. If GP resconds are found with no lat long values these lines are skiped. The criteria for skipping a line is that'- ' is found.
11. Fixed an error where an access violation would occur when a workspace with an active SkyTEM processing was closed
12. Fixed an error with the map point symbols in the SkyTEM processing system
13. The select point tool is now default for the SkyTEM edit-window.
14. The Constant factor shift for the edit window is now remembered.
15. Problem with Edit Display for the SkyTEM processing position marker on the GIS MAP is fixed.
16. The SkyTEM select GIS tool now works a the first click. A warning is given if you select other than SKYTEM processing points on the GIS-map with the SkyTEM select tool.
17. Fixed an error in the SkyTEM processing system where the raw GPS would suddenly be removed from the map

CVES module, Bugs and enhancements

1. Problems with screen saver related program termination have been solved.
2. Added support for floating point sounding distances.
3. The RES2DINV viewer can now be closed if the inversion job stopped unexpectedly.
4. Section panels in the RES2DINV viewer have been adjusted to fit

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- individual screens
- 5. Fixed a bug preventing RES2DINV to start in rare cases.
- 6. Fixed a UTM related indexing error - the correct points are now shown on the map when marking points in the RES2DINV inversion result viewer
- 7. CVS-import: If a topography file is specified it now overwrites the topography from .dat or .inv file.
- 8. Added triangulated interpolation (optional) to the pseudo section display options.
- 9. Processing and inversion of CVES dipole-dipole data now works correctly.
- 10. Added support for reading of topography from .dat files.
- 11. An informative exception is raised if the user tries to import non-supported datatypes.
- 12. Fixed a display bug with the artificial top layer used for triangular interpolation in the RES2DINV viewer. Made triangulated interpolation the default setting for the model form
- 13. The default positions of the forms in the RES2DINV system have been changed to fit on most screens by default.
- 14. The heights of the processing windows have been changed to reflect importance.
- 15. Making a DBQ from CVES models using the normal DBQ functionality now work - no extra models are added.

Various Bug-fixes

- 1. Changed default vertical constraints to medium for automatic smooth inversion.
- 2. Bug fix in the automatic inversion settings: Until now lateral depth constraints has been added for smooth inversion and not for layered inversion. This has been reversed so lateral depth constraint are now added for layered inversions and not for smooth inversions.
- 3. Added support for fast inversion jobs and resubmission to the MT module.
- 4. Fixed a calculation error in the residuals displayed in the inversion system. (A factor squareroot N).
- 5. Save chart and open chart functionality is removed from main menu of Workbech MainForm
- 6. Automatic max sounding gap set to 250 meters for airborne methods, 75 meters for others on the automatic inversion setup.
- 7. Various bug-fixes relating to the HEM data and model importer have been fixed.
- 8. Input coordinate system for profile from file has been added

12.03.2007 2.2.32.549 Bug fixes

- 1. Missing icons are back on the main menu.
- 2. Minor functional changes in the new CVES importer.
- 3. The status panel for the Survey Info Browser has been removed.
- 4. SkyTEM-import: All skb files containing errors are now skipped. All usable data in the file read before the error are kept. Partly corrupt files are typical created if the SkyTEM program is terminated unexpected, preventing the program from closing the skb file.
- 5. The Set Survey Info has been renamed to Add Survey Info
- 6. A number of Scratch files was erroneously written to c:\temp preventing import of CVES and SkyTEM data if the directory did not exist. This has been fixed.
- 7. When importing SkyTEM data it is now checked that the correct version of the geometry file is loaded before that actual import to GERDA is initiated.
- 8. Import Done message has been added to the HEM-importer

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09.03.2007 2.2.32.548

Bug fixes

1. A bug with the lic-file for em1dinv has been fixed.
2. Changed the shortcuts on the auto inversion form.
3. Minor graphical changes to the "Inversion Type" Form.
4. Change in the SkyTEM datafile selection scheme. Previously, the first used sounding was the first before "fromtime" now it is the first after "fromtime".
5. UTM coordinates are now added correctly to the database when running res2dinv inversion.

06.02.2007 2.2.32.547

New Inversion mode

1. A new automatic inversion mode has been implemented. The automatic inversion mode automatically creates intelligent starting models, section lengths and lateral constraints. Thus, the automatic mode requires a minimum of user interruption.
2. The numerical code running the inversions now supports 64bit architecture. The Aarhus Workbench automatically detects if a 64 bit machine is used.

New CVES data importer

1. A simplified importer for geoelectrical CVES data has been implemented. With the new importer the user only points to a dat or inv-file and selects a coordinate system. UTM-location of the individual electrodes is optional. If that information is not given, the electrodes will be placed in an arbitrary coordinate system, to still be able to view them on the map.
2. It is still possible to access the old importer (for Danish users), but a few plot options has been disabled.

General

1. Nodes in the Workspace Manager which has corresponding visible layers on the map is now shown with text in bold.
2. Added sounding up/down and play hotkeys on all relevant forms in the inversion system.
3. When a grid is loaded in the Topography form the corner coordinates are now transformed and shown in the same coordinate system as the data.

SkyTEM

1. It is now possible to add topography to a SkyTEM dataset or processing node. If topography is added to a dataset node all processing nodes under the dataset node are altered. The topography is automatically migrated into the inversion system
2. It is now possible to divide SkyTEM instrument data stacks into smaller raw data stacks. The division is done during data import from binary files to the GERDA database.
3. A bug preventing data processing in datasets where only parts of the data has all software channels present has been fixed.
4. The following changes and enhancements has been made to the inversion system for x-data:
 - Adaptive models has been implemented. Resistivities for x-models are taken from the last z-model if possible.
 1. Lateral constraints on altitudes are implemented. The constraints are scaled similar to the other model parameters.
 2. Constraints on altitudes between x- and z-models are scaled with the x-lateral scaling factor - this means that the altitudes in practice are locked together.
 3. The x-tilt angle is given an a-priori values of 4 deg.

Res2dinv viewer

1. The iteration and log windows on the RES2DINV Viewer now auto-selects its last items
2. Chart tools from right-click menu added to RES2DINV Viewer

Bug fixes

1. Datasets are now automatically loaded when reopening a Map

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2. Negative PACES data are now marked not in use in the DB when loaded.
3. Fixed a sounding point to electrode mapping error. This would sometimes give the error message: "Error in TpioModel1DCVS.SetSequences" when trying to open a CVS 1DLCI inversion node.
4. Fixed an error where model sections could not be reopened if the user had changed the color scale without saving this as a file
5. Apriori depth STD is now properly changed on the Redefine Start Model form.
6. Fixed an error where inversions could not be resubmitted due to use of outdated inversion settings
7. Changed default mode on the model section form to bar mode.
8. The CVS Explorer now recalls the previous focus depth selection and left/right sorting setting.
9. Several access violations fixed in the CVS module(Ownership/messaging errors).
10. Fixed an error that prevented TEM soundings to be imported to newly created GERDA projects
11. Profiles are no longer opened automatically when the user cancels adding layers to them
12. Fixed an error where the Chart Tools menu item could not be turned on/off
13. Fixed a bug that prevented .eZ topography files from being imported in the CVS module.
14. Fixes an error where the cancel button did not work when changing color scale on the Model Section
15. The correct maximum z-value is now shown in the Add Topography form.
16. Fixed an I/O exception problem in the RES2DINV viewer.
17. Added new shortcuts to the model position explorer and the model position explorer settings form.

09.01.2007 2.1.31.546 Bug fixes

1. A number of constraints in the database structure has been released in order to be able to define instruments that are not originally in the import database.
2. Access databases can now be used with CVES data.
3. A number of spelling errors and confusing dialogs has been fixed and improved.
4. Key violation from batch inversion program Embi fixed.
5. Warning for missing Processing Person and/or Recording Person during import has been removed. If the fields are not specified, the record is left empty in the database.
6. Fixed some access violations in the CVES importer.
7. Topography data can now be read directly from .dat and .inv files on importing CVES data.
8. The plot forms on the Res2dinv viewer no longer updates when cancel is clicked on the settings forms.
9. The CVS data profile and sounding curve plots are now correctly updated according to the setting of the "show lines" checkbox.

21.12.2006 2.1.31.545 Database upgrade

1. A new and enhanced version of the data management system, the GERDA database has been implemented into the Aarhus Workbench. This version of GERDA is the first official release from the Geological Survey of Denmark and Greenland with the new table definitions for SkyTEM, HEM and MT data. Lots of changes has been made to the database but we should have managed to keep the Workbench backward compatible.

New inversion modes

1. The inversion system has had a "fast mode" inversion added. The

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fast mode uses the result of a previous section as starting model to reduce the number of iterations.

2. A mode to force continuous models along long sections has been added as well. This mode applies a-priori information from the last model of a section to the first model of the next section to ensure continuity. As a consequence it cannot run in parallel.
3. To support these two new inversion modes we have implemented support for different .con files. Thus, the path to the con-file and em1dinv.exe can no longer be set, they should always be located in the workbench\em1dinv folder.

Bugs and enhancements, General

1. Fixed an error where number of layers would not be initialized when loading an inversion model file.
2. Inversion settings tab-sheet "Inversion" has been updated.
3. The progress bar in EMBI now shows actual progress.
4. Added an error message if a specified database name exceeds 32 characters
5. A "Recent Opened Workspaces" function has been added to the File menu
6. A bug relating to the splitting of long sections has been fixed
7. Fixed several nil pointer errors on the model section form.
8. The list-view on the model position explorer now remembers its selection when updating
9. Fixed a synchronization bug in the inversion system.
10. A bug preventing "Copy Chart" from some plots has been fixed
11. Changed code to improve speed of the scroll and autoplay features on the Model Position Explorer.
12. Fixed an error where the Chart Tools menu item could not be turned on/off

Bugs and enhancements, SkyTEM

1. Added channel specific default processing settings for SkyTEM data.
2. Fixed an error that prohibited SkyTEM processings with processing settings that were not within predefined limits from being opened

Bugs and enhancements, CVES

1. Removed UTM warning dialog when submitting data for res2dinv inversion.
2. Added "import done" dialog to the CVS importer.
3. Fixed a bug that prevented res2dinv resubmission from running.
4. Removed "Critical Setting" warning dialog when setting the path for RES2DINV.
5. Coincident datapoints are now averaged when written to .dat file and submitted for RES2DINV inversion.
6. The pseudosection form now synchronizes its zoom level with the other forms in the CVS processing system.
7. ACCESS Databases are now supported in the CVS module.

17.11.2006 2.0.30.544

1. Fixed an error in the numerical code em1dinv that caused a malfunction when inverting data.
2. Bug in function to blind last layer is fixed
3. A few windows have been redesigned

07.11.2006 2.0.30.543

13. Added an option to blind last layer when creating Interval resistivity themes
14. Fixed a bug on the Model Section Plot where residual curves would not be moved along with model bars
15. Fixed a bug in the inversion system where invisible data points could be toggled on/off

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16. A problem with a "locked table" during data import in Embi has been fixed. Embi now retries to import the data after 5 sec
17. The layout of the Inversion Settings form is now remembered
18. Paths are now remembered when saving and loading files in the inversion module
19. Redesigned the "RES2DINV Inversion Result" form.
20. RES2DINV explorer now closes its subforms when the windows close button is clicked.
21. Added "apply STD filter?" dialog when resubmitting RES2DINV data.
22. Added validation of electrode UTM coordinates in the CVES processing system.
23. Fixed a visual bug on the RES2DINV model section plot form
24. Fixed an error that occurred when importing shp files to directories with non-UK characters in the name
25. Multiple files can now be selected when importing shp files
26. Properties is now available on processing nodes
27. Fixed a bug in the ClayThickness routine
28. Added a Get Time Limits function to the Select Data for Inversion form
29. A pause function has been added to EMBI
30. Process priority can now be changed during inversion with EMBI
31. em1dinv in version 4.31 is released with the update.

18.10.2006 2.0.29.542

Various bug fix

1. Coordinate transformation.
2. Lateral focus points are now written out in dcp files
3. Changes in the SkyTEM processing settings.
4. Fixed a bug where soundings curves would not be shown properly in the inversion system.

06.10.2006 2.0.29.541

Bugs

1. Fixed a selection bug when using the play feature on the Model Position Explorer.
2. Fixed a bug with the GIS tool icons.
3. STDs are now shown with 3 digits on the "Inspect Start Model Form" in the 1D inversion visualization module.
4. Fixed a bug where the wrong starting model would be used when resubmitting SkyTEM inversion jobs.
5. Fixed a bug relating to the use of smooth colorscales that prevented the user from making bitmaps.

04.10.2006 2.0.29.540

New Name

1. With the release of version 2.0 the official name has been changed to the Aarhus Workbench instead of just the Workbench

Updated CVES module

1. The CVES module has undergone thorough testing since the first release. It is now possible to do 2D inversions using an build-in interface for RES2DINV. The inversion results are read back into the workbench when the RES2DINV has finished enabling visualizations directly in the Workbench.

Inversion

1. The inversion job form is now general for all data types.
2. A resubmit option has been added to the "View Inversion Result" window. It is possible to fully or partially resubmit an inversion. When resubmitting changes can be made to the starting model or different constraints can be applied.
3. Data points can now be deleted for a resubmission based on the difference between the observed data and inverted data.

SkyTEM inversion

1. Altitudes and angles can now be visualized in the "View Inversion Result" on the Inversion Explorer and on the Section Window. It is possible to see both the starting values for the inversion as well as the output values from the inversion.
2. A special constraint can now be defined on the Inversion Job window for the combined inversion of x-data and z-data.

Bug Fixes SkyTEM

1. If the altitude for the transmitter is undefined (it is standing on the ground) the transmitter and receiver altitudes are set to the values defined in the geometry file.
2. If the altitude of the receiver coil is larger than the altitude of the transmitter coil (the receiver is below the transmitter) the altitude of the transmitter is moved downward by half the altitude difference between the two coils. This prevents the receiver coil to move down in the first layer when using Semdi for inversion. This change does not apply when the inversion is done in the Workbench
3. The width of the trapez filters has been increased by a factor of two so the width given under the processing settings is the full width - not the half-width. All filter widths already stored in the GERDA database are automatically recalculated when a processing node is activated.
4. All Key fields in the SkyTEM list fields are upgraded so the Key is no longer a string but an integer (stored in a character field). The upgrade is done automatically when a SkyTEM processing node is activated.
5. The correction factor is now applied independent of the altitude - i.e. the factor is always applied.
6. Changed the default values in the SkyTEM processing so they fit the recommended settings.
7. SkyTEM data points can now be deleted from the Sounding plots
8. Exception handling for cleaning up the Workspace and memory has been implemented if an error occurs during basic processing of SkyTEM data.
9. The progress counter is now reset before writing the tem files for a particular software channel.
10. An error in the SkyTEM geometry loader causing the number of devices to be wrong has been fixed

Other bug fixes

1. The performance for updating points on the map from e.g. the inversion module or the CVES module has been dramatically increased.
2. Added search function to the "Create DBQ from Inversion Jobs" window. Also fixed a bug that would cause an exception on clicking OK with no items selected. Made the form height adjustable.
3. Negative RMT data values are now marked as not in use when submitting them for inversion. A warning dialog has been added to make the user aware of this.
4. Fixed a bug in the RMT module that sometimes prevented E2/H1 data from being written
5. Fixed a timer bug that would sometimes cause an out of bounds exception on the Inversion Model Explorer window.
6. It is now possible to save inversion settings when entering an inversion via the properties button.
7. Power law dependency is implemented for the inversion system

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- for all data types
- 8. Fixed a bug that would sometimes cause out-of-bounds exceptions on the Model Position Explorer.
- 9. Fixed a +/- 1 STD error in the resubmission code
- 10. Properties on CVES nodes added
- 11. The CVES and HEM import-modules have been optimized for a much faster import.

27.06.2006 1.9.28.517

NEW CVES module

1. A fully functional CVES module has been implemented.
2. The module contains of three parts: 1) An existing data importer importing ascii datafiles to the GERDA database format; 2) A processing system allowing the user to view data as soundings, pseudo-sections or profiles. Bad data points can be removed or extra noise can be added to individual data points; 3) An inversion part featuring 1D-LCI type inversion of the data sets using the embi program. Both multi-layer and few-layer inversions are supported. 2D inversion will be ready for the next release.
3. The map is fully integrated enabling map-view of individual electrodes or sounding positions. Topography is also supported.
4. Asymmetrical electrode configurations such as gradient array type data or dipole-dipole data are fully supported and the visualization tools are designed to handle these configurations.
5. It is not possible with the current release to open and re-process data set already imported to GERDA.

Embi

1. A coloured panel has been added to embi. A green panel indicates no errors and red indicates that errors have occurred

MT module

1. A few bugs have been fixed in the inversion part of the MT module

SkyTEM module

1. The minimum standard deviation on the altitude has been changed to 10 %
2. A sign error on the altitudes caused the Tx and the Rx position to be shifted in the SkyTEM processing module. This has been corrected.

Bug Fix

1. Coordinate systems on the southern hemisphere are now supported
2. A bug relating to user-defined colour scales when viewing inversion results has been fixed.
3. Profiles generated with "Copy profile layers" now has the same layer selection as the parent profile

03.05.2006 1.8.27.516

Important (Danish user only)

1. Before uploading Interbase databases to GERDA (GEUS) remember to run DBUpgrade.exe with SQL-script "Clear tables.sql".

Optimization

1. Support of MEP data sub-array type 14-15 (gradient data) from RES2DINV inv-file (new types).
2. TEM and CVES importer modules now support a range of coordinate systems.

Bug Fix

1. Problem with importing data into a access databases fixed
2. Minor bug fixed

29.03.2006 1.8.27.515

Bug Fix

1. Import and processing MT data.

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10.03.2006 1.8.27.514 **Optimization**

1. Importer is optimized by using a centralized import object. For most imports this results in a much faster import.

Inversion Visualization Module.

1. Data Residual Column added

Bug Fix

1. Delete node. Fixed bug where nodes having substring like the node intended for deletion, also was deleted.
2. Inversion Visualisation system. It is now possible to save deleted points to the GERDA database.
3. Fixed error in Inversion Job.
4. Added check of empty model list, prior to starting the Inversion Visualization system.
5. Active SkyTEM processings are now closed when the workspace is closed.
6. Appended _Inv to names for exported files in GeoSoft Inversion Model File.
7. Header in xyz-files in geeditor format has been changed.
8. Fixed an error in the SkyTEM inversion module where the forward response curve could be toggled on/off.
9. Default database type for "connect to database" has been changed.

07.03.2006 1.8.27.513 **Inversion Visualization Module – SkyTEM and MT data types.**

1. For a visual interface of the inverted data, there is now a complete inversion visualization module, which gives the opportunity to view inverted data as model-bars, model-lines, model-data curves and as tables.
For ease of viewing it is possible to view only a selection of the data, it is even possible to set the system in "play" mode, so it automatically changes the selection every so and so seconds.
2. Inversion is now fully integrated in the Workbench. The inversion can be set up as laterally constrained inversion (LCI) and LCI with smooth models. There is no need to start external processes for the task manually.
It is even possible to start the batch inversion controller program EMBI (through the Workbench) in multiple instances or on multiple computers (when running the Firebird database). The output data from EMBI is stored directly in the Workbench database.
3. The inversion kernel em1dinv is now "locked" to the Workbench. The kernel is shipped in version 4.0x.

MT (RMT) Processing Module

1. An importer part. Importing MT raw data ascii files to a GERDA database. The raw data files are linked to spatial positions through a location file listing station names and utm-positions for all data.
2. A processing part. The processing displays the imported data and allows the user to remove bad data points and/or specify extra noise to specific data. The changes are saved to the database.
3. An inversion part. The inversion part has many features for laterally constrained inversion (LCI), vertical smoothing of models and adding a priori information allowing the user full control of the setup of the inversion process.

Import and export of shape and geo-tiff files

1. The Workbench is now fully integrated with the ESRI file formats shape and geo-tiff. Shape and geo-tiff files can be loaded into the GIS map similar to tab files. Also all Workbench themes can be exported as either shape files or for raster images geo-tiff files.

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Bug Fix

1. Coordinate transformation – Under certain circumstances the EPSG value was translated wrong.
2. Made the Cancel button on the "Select database type" form work.
3. The title line in xyz files is translated to proper English.
4. A geometry object can be reapplied to a SkyTEM dataset
5. The gate standard deviation from the geometry object is now added to the raw data for SkyTEM data.
6. A factor of 2/3 was missing when transforming dbdt STD to Rhoa STD (for geometry and user STD) for SkyTEM data.
7. It is now possible to export models on profiles to .XYZ files.
8. Two indexes are added to the GERDA database on the ODVMODSE table when a GERDA database is loaded into the Workspace. This greatly increases the performance when extracting large DBQ's
9. Problem with matching currents in SkyTEM is now fixed.
10. Plus lot and lots of other fixes.

27.09.2005 1.7.26.512 **Bug Fix**

- 1) Jupiter databases in coordinate system EUREF89 causes an error when extracting boreholes. The reason was that EUREF89 is spelt EUREF. The Workbench recognize now EUREF as EUREF89.
- 2) Because of missing indexes in the Gerda TEM tables some queries could take very long time to fetch. The missing indexes are now created on the fly.
- 3) It is now possible to export SSV themes to ascii files.
- 4) On the SSV Borehole Editor a check has been removed on the field Use Intervals. The check could sometimes make it impossible to close the window.
- 5) A check has been changed on the Job editor so standard deviations below 2 are allowed.

14.09.2005 1.7.26.511 **Bug Fix**

1. It is possible to extract Themes Data in SSV Module. The New Themes... item is enabled.

07.09.2005 1.7.25.510 **New SSV Module**

- 1 The SSV is a new concept using geostatistical estimation and non-linear inversion to optimize a function translating geophysical resistivity models to geophysical clay thickness incorporating reported clay thicknesses in boreholes. The clay thickness in the upper part of the subsurface is an important factor for the water infiltration speed and thereby the vulnerability of underlying aquifers. Borehole information contains the most detailed information on clay thicknesses, but is most often too sparse for the detail level required in actual mapping situations. Geophysical data, on the other hand, has the desired spatial coverage but the measured quantity is resistivity and not clay thickness. The SSV concept act as a hands off interpolator between the boreholes translating the geophysical models to geophysical clay thickness. The concept includes geophysical data uncertainties and uncertainties on the description of the boreholes. The primary user input is reported clay thicknesses with uncertainty levels for boreholes in a

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borehole database query (BHQ). The borehole clay thicknesses are then connected to the geophysical information through one or more data base queries (DBQs).

Various bug fix

- 01.07.2005 1.6.24.508 **Bug fix**
1. A memory allocation error has been fixed when loading layers on profiles. The allocation error only occurs when loading very large datasets.
 2. An coordinate system error has been partly fixed when drawing profiles on the map. When working with the map do NOT try to change the projection of the map - let MapX handle this itself. Changing the coordinate system causes the profiles to be located at shifted coordinates. The bug will be fixed in a later release of the Workbench.
 3. A bug causing an access violation when creating new SkyTEM processing nodes has been fixed.
-

- 27.06.2005 1.6.23.507 **Bug fix**
- All importer modules in the Workbench have been changed so that data and model parameter standard deviations has the form 1.xx. The old format was either 0.xx or 1.xx.
-

- 15.06.2005 1.6.23.505 **SkyTEM processing**
1. Shortcuts have been added to sounding plot and sounding list for scrolling and updating buffer.
- Bug fix**
1. An error handling coordinate transformation of borehole coordinates has been fixed.
 2. Data Theme error handling on Access database has been fixed.
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- 27.05.2005 1.6.22.503 **Bug fix**
1. An error handling coordinate systems has been fixed.
-

- 26.05.2005 1.6.21.502 **CVES Module**
1. CVES processing: 1D processed data can be exported to DCP files.
 2. CVES processing: Bug fix: Column in Res2DInv export file with GERDA keys has been removed. This column caused error when read by Res2DInv.

SkyTEM Module

1. SkyTEM processing: License check has been added to SkyTEM processing module

Other

1. EUREF 89: Bug fix: DB Queries on Access GERDA database with data in EUREF 89 caused error. This has been fixed.
 2. EUREF 89: Bug fix: Creating a tab file for a MapInfo image caused error, because the map component does not support EUREF 89. Instead WGS 84 is now used by tab files.
 3. Processing modules: Sounding positions and data have been separated on two charts on the processing form.
 4. ESRI shape files: Shape files can be imported and exported into the Workbench. The shape files are internally converted to tab files and added to the GIS map. When exporting raster images (e.g. the thematic maps) they are exported as geo tiff files.
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- 05.05.2005 1.6.20.498 **New Functions**
1. Combined themes.

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Now it is possible to combine themes on the map. Data are extracted from DBQ's and can be combined on different criterias (f.x. Depth STD, Thickness STD, Elevation, Resistivity and so on...). The new function is placed in Workspace manager tree on the map dropdown menu and is called New Combined Themes...

2. **Data Theme (Only for Paces Data)**
The function creates a new data theme showing apparent resistivities for the paces data. The function appears in the dropdown menu in Workspace Manager tree and is called New Data Theme....

Changes and bug fixed in SkyTEM processing.

1. A number of bugs have been fixed in the SkyTEM processing module

04.04.2005	1.6.20.495	Bug fixes I SkyTEM processing	<ol style="list-style-type: none">1. A number of minor bugs have been fixed in the SkyTEM processing module.
11.03.2005	1.6.20.486	Changes and bug fixes	<ol style="list-style-type: none">1. When saving rerun of processing only values changed are saved.2. Buffer position is stored for next run.3. SITEM functionality for Soundings list form.4. Listing of auxiliary parameters in sounding list box.5. Update and fixes in editing form.6. Progress bars added for several time consuming procedures, mainly when interfacing with GERDA.7. Fix of ACCESS version of workspace manager database.8. Button added for geometry file edit tool in SkyTEM import.9. New extension on setting files ".pro"10. New commands button on settings-form giving access to right-click menu.11. Update of default processing parameters.12. Enhanced user interface.13. Numerous other minor bug fixes in user interface and database IO.
03.03.2005	1.6.19.483	New Functions	<ol style="list-style-type: none">1. SkyTEM processing. First release of new module for processing of SkyTEM data. The module in its current state includes :<ol style="list-style-type: none">a. Import of raw data into GERDAb. Filtering and editing of datac. Filtering and editing of altitude measurementsd. Display of control parameterse. Integration of data processing with GERDA databasef. Export of data to TEM files for inversion in SEMDI
04.01.2005	1.5.18.455	New Functions	<ol style="list-style-type: none">1. Output to GeoEditor and GeoSoft. Output of models has been added to DBQ export menu.2. Import from external files. A dummy value can now be set, to exclude positions in themes.

Changes

1. **Add Topography.** You now specify the coordinate system of the Grid file holding the topography data. If the coordinate system differs from the Query coordinate system, the grid coordinates are

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- transformed to match the query coordinate system.
2. **View data.** Selections of new data are no longer added to the same form, but to one form for each selection.
 3. **Export map to file or clipboard.** Has been separated into two forms – one for export to file and one for export to clipboard. Settings of export have been reduced to resolution and size.
 4. **Memory setup.** When setting up memory usage for Workbench, user does no longer has to pass the location of the firebird.conf file. The user interface has also been simplified.
 5. **DBQ.** When making a new DBQ all TEM subtypes (e.g. tem40, skyTEM1 etc) are shown in the data type select field.
 6. **Upgrading the workspace.** A check has been added to the upgrade procedure so that the original workspace is restored automatically if an error occurs during an upgrade. Furthermore, is now checked that the user has sufficient disk space for the upgrade.
 7. **Check for disk space.** Check for free disk space has been added when opening the workspace and when clicking a node in the workspace manager. The following checks are made on
 - a. the workspace directory drive. A warning is shown if the free disk space is below 100 Mb.
 - b. the TEMP directory. A warning is shown if the free disk space is below 400 Mb. This directory is also used by MapX.
 - c. the workspace directory whenever a node is selected. A warning is shown when the free disk space is below 50 Mb. This check is bypassed if requested at an interval at less than 20 sec.

Various bug fixes

14. **New Profiles.** Various changes in user interface.
15. **Point Theme.** Colour scale is saved.
16. **Import from external files.** A number of minor errors have been fixed.
17. **Zoom on profiles.** When zooming on profile with a large amount of data, the zoom becomes very slow. This has been fixed.
18. **Disconnect from GERDA database.** An access violation occurring when Del is pressed on a GERDA database has been fixed.
19. **DBQ.** Pressing the Cancel button when asked for a DBQ name did not stop the creation of the DBQ node.
20. **New SQL for queering models.** The SQL used for queering models has been rewritten for enhanced performance.
21. **SkyTEM online.** Support for moving map added.
22. **Topography.** Fixed errors with progress bar and removed some of the reporting to Workspace log.
23. **GSTAT gridding.** Fixed problems with progress bar. In the start up of a gridding GSTAT uses a lot of time on sorting the data into a quad tree structure. This is now reported to the user in text instead of actual progress in the bar which now exclusively reports actual progress on the gridding itself.
24. **PACES Import.** While importing data a lot of unnecessary information was added to the workspace log. This has been removed.
25. **Profiles.** A lot of unnecessary information was added to the workspace log. This has been removed.

12.11.2004 1.4.16.444 New Functions

1. Import of external files. Data can be imported from ASCII files into the workbench. Themes, grids etc. based on these files are now

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- supported.
- 2. 3D visualization. New functionality for viewing grids and boreholes has been implemented and is released in a preliminary version.

Various bug fixes

- 1. Workspace database. A bug in the previous version of the workspace database has been fixed.

28.10.2004 1.4.15.436

Various Bug fixes

- 1. When reopening a map the dataset on Geophysical theme layers on the map were not loaded. This has been corrected.
- 2. Colour scale saving. Saving to a colour scale file had an error which has been corrected.
- 3. Database. It is no longer possible to make a DBQ or BHQ when no databases are active.
- 4. Export. When exporting layers the layers are no longer redrawn regardless of export type. Now the redraw is only made when strictly necessary to generate the files to export.
- 5. Map Layers and GST files. When a reference to a layer existed in a GST file and a reference also existed in the WM, but the tab files had been deleted, the workbench was unable to open the map and thus the workspace. This has been fixed by removing the reference in the GST file, and setting the layer to invisible in the WM.
- 6. CVES Importer bug. Errors have been fixed in the CVES importer. When importing General Arrays, both lateral focus points in TDVFWRES.DISTANCE and center positions of cells in TDVCELL.DISTANCE wrong positions were written.

New Functions

- 1. Labels on profiles. The labelling on profiles has been significantly improved. It is now possible to have full control of labelling of layers, titles of bars, labels with projected distances from profile. Furthermore functionality for merging well layers, skipping labels etc. has been implemented. When updating old workspaces, existing label settings are replaced with default values.

06.09.2004 1.4.14.426

Various Bug fixes

- 2. Open Workspace: When opening a workspace, the same functions were called repeatedly.
- 3. Open Workspace: A workspace could not be opened if the last opened workspace was positioned on a network drive, which has been disconnected.
- 4. Open Workspace: If a workspace is moved from a network drive, it cannot be opened.

31.08.2004 1.4.14.422

Various Bug fixes

- 1. Workspace Manager: Synchronizing between map, profiles and Workspace Manager has been optimized.
- 2. Add Topography: . When adding topography to data and models where models shared the same data, e.g. in overlapping PACES sections, only one of the models were assigned a topography value when working on a dataset query. This has been fixed.
- 3. Copy background layers. The copy functionality now removes any write protection from the layers stored in the Workspace.

New Functions

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2. Borehole Reports. It is now possible to view scanned borehole reports directly from the map.
3. Point Pattern. DBQ, BHQ and theme map point properties are now edited and stored directly in the Workbench.
4. Grids on profiles. It is now possible to control the distance sampling of the grid for the profile.
5. Layers on profiles. Functionality for copying layers between profiles is now in place.
6. New profiles can now be created from PACES ticloc ASCII files, or XY ASCII files. Functionality for making fence diagrams and copying and shifting existing profiles has been implemented.

06.08.2004 1.4.13.408

Various Bug fixes

1. CVES Import: Importer could not import a profile, if an electrode defined in way point file, did not exist in INV file. A memory error was produced, that might make the system crash.
2. TEM Import: When Model and Dataset ID's didn't match, elevations could be added to wrong soundings, when mapping from a Data Query to the model part of GERDA, and visa versa.

Help

7. Online help: The online help has been updated with this version.

25.06.2004 1.4.13.405

Various Bug fixes

1. CVES Import: Unable to import general arrays. Has been fixed.
2. CVES Import: TwoDVMod.IsTopoMod in GERDA is set to wrong value, when topography has not been included in modelling. Has been fixed.
3. DB Query: Error in sql when executing query on an ACCESS GERDA database. Has been fixed.
4. Colour scale: When using first level in a smoothed color scale, the colour is set to the colour of the last level of the scale. Has been fixed.

18.06.2004 1.4.13.401

Profiles

1. New: Boreholes from PCJupiter can now be displayed on profiles. Layer colours are extracted directly from a table in the PCJupiter database.
2. New: [ALT + Left Click] on a Borehole Bar on the profile plot launches the Borehole report for the borehole.
3. New: Layer managing is now possible on the workspace manager. Right clicking a profile data node and pressing "up" or "down" moves the data up or down in the plotting sequence of the profile plot.
4. New: Labelling of layers and bars are now available on model and borehole bars.
5. Change: The editing of model and borehole bars displayed has been enhanced.
6. Change: Individual Models and Bars on the profile can now be temporarily edited directly on the profile plot.
7. Change: When adding a data node to a profile, the data are now instantly shown on the profile.
8. Bug Fix: When extracting coupled data onto the map in a query, the profile gave an error when trying to locate a model for these map points. This error has been fixed. A warning I written in the Workspace Log for you to inspect.

Borehole Module

1. New: Query functions have been implemented for extracting a selection of boreholes.

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2. New: A browser for the Jupiter database has been added.
3. New: Settings of boreholes.

DB Query

1. Change: The form for setting up a DB Query has been changed.

Various bug fixes:

1. Bug fix: Error when opening workspace using tif files as background layers. Background files with write protection also caused error. Has been fixed.
2. Bug fix: An error in drawing data values in View Data form has been fixed.
3. Bug fix: An error in colour scale has been fixed.
4. Bug fix: A periodic error when writing tab files has been fixed.
5. Bug fix: Fixed bug in validate function.
6. Bug fix: Bug, causing selected sounding in view data not to be selected on map, fixed.

17.03.2004 1.3.12.336 Borehole Module

5. New: Boreholes from PCJupiter can now be displayed on a map, and inspected through the Borehole report generated by GEUS.

All Import Modules

1. Update: New Gerda structure implemented.

30.01.2004 1.3.11.319 Main Program

1. New (TB): Profiles. Grids are now fully implemented in the program, enabling cutting and displaying grid values in various forms on the profile plots.
2. New (JRP): Printing is now possible on right-click menu on colour scale.
3. Minor Change (TB): When updating to new workspace version default values are now used for missing parameters from old profiles.
4. BugFix (TB): When restoring a workspace the layers on the profile form were drawn twice. This has been corrected.
5. BugFix (TB): Profiles. Fixed bug in linking models on profile plot window with models on map.
6. BugFix (TB): Grid Image. Fixed annoying bug reporting "unable to open lvl file" when showing image dialog.
7. BugFix (TB): Grid Image. Fixed "after burner" error, causing the image to be slightly shifted.

08.01.2004 1.3.9.312 Main Program

1. New (JRP): A template can be generated from map. Settings of all background files are copied from the map and saved into a text file. The user can create a new map from this template, or the files can be imported into an existing map.
2. New (JRP): Background theme files can be copied into a workspace folder WorkspaceDir\BackgroundThemes. With this, all files are placed in workspace folders, and the workspace can be move to another location.
3. BugFix (JRP): Errors in print of map has been fixed. On colour scale form, a print menu item has been placed on right click menu.
4. BugFix (TB): Profiles is now fully implemented for DBQ's (both TEM and PACES) and partly for Grid Themes. Added extra functionality for adding profiles and editing the plotting layout and corrected some minor bugs.

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5. New (TB): Added support for exporting Grids in Vertical Mapper Grid format.
6. BugFix (EA): Running of GSTAT on a network drive is now possible again.
7. Optimization (EA): The extraction of Models from GERDA has been further optimized.

01.12.2003 1.3.8.265

New Function – Profiles

1. New (TB&EA): A new function has been introduced in this version of the Workbench. A line can be drawn on the map, and a profile is generated from this, showing DB Query points near the profile line.

Main Program

8. Optimization (EA): The extraction of DB Query points from GERDA has been optimized.
9. BugFix (TB): Error in general layer search has been fixed.
10. BugFix (JRP): Error when cancelling GSTAT has been fixed.
11. Change (JRP): The map is now always saved, when a change is made on the map.
12. Optimization (JRP): The saving of bitmaps has been optimized.
13. Change (JRP): Export of DB Query has been added.
14. BugFix (JRP): Error in validation of layer names has been fixed.
15. BugFix (JRP): Value field on geophysical theme label has been added.
16. BugFix (JRP): Colour scale of theme points can now be shown.
17. BugFix: Various minor bugs have been fixed.

CVES Import Module

1. Bugfix (JRP): Various minor bugs have been fixed. None has to do with imported data.

14.10.2003 1.3.8.260

Installation

1. Change (EA): IDDA3235.dll is now set in the BDE manager during the installation of the workbench.
2. BugFix (TB): An error in the installation of DAO has caused Windows Installer to be called during execution of the Workbench. This has been fixed.

Main Program

1. Change (EA): A workspace can only be opened for exclusive use. If another user tries to open the workspace, an error message is given. This prevents the workspace from becoming corrupted.
2. Change (EA): Workspace log browser can now be viewed from workspace menu.
3. BugFix (JRP): An error in logarithmic gridding has been fixed.
4. BugFix (JRP): Tree nodes in workspace manager was sometimes positioned below tree, with no parent. This has been fixed.
5. Change (JRP): A workspace can be moved to another folder, without corrupting the workspace.

Module Surface

1. New (TB): Added interpolation of grid to image pixel size. The interpolation is performed on an existing grid, from a Krieging, and is done by a triangulating procedure. This ensures that the original resolution of the grid is not compromised, and that areas between grid nodes are assigned a reasonable value making the image smoother.
2. New(TB/EA): A Gerda database can now be assigned topography using a Surfer Grid file containing topography data.

TEM Import Module

Aarhus Workbench release history

1. New (TB): Added support of SkyTEM data type.
2. Change (TB): The importer now uses the internal Workspace Log instead of a log file.
3. Change (TB): The assignment procedure of a map to the importer has changed.

CVES Import Module

1. Bugfix (JRP): An error in calculation of coordinates from surfer grid file has been fixed.

18.9.2003 1.2.7.258

Main Program

18. BugFix (JRP): When a grid image is exported, the name of the image in the tab is changed so it does not contain the absolute file path.

CVES Import Module

1. Bugfix (JRP): Idents of models to be imported are changed. Ident of a 1D model is *<project>.mep.<name>section<no>* and ident of a 2D models is *<project>.mep.<name>*. Iteration number is not written in ident.

17.9.2003 1.2.7.257

Main Program

1. BugFix (EA): When the user presses the Cancel button in the window where he select database type the program continues to open the workspace. This is fixed and the radio buttons is now also initialized correctly.
2. BugFix (JRP): Before a map is shown, it is checked that all referenced files exist. If a referenced file doesn't exist, the user is prompted for a removal of the layer.

CVES Import Module

1. Bugfixes (JRP): No topography was imported with a 1d dataset, and current and potential electrode was switched.

11.9.2003 1.2.7.255

Main Program

1. BugFix (TB): Bug in *Colour scale Engine* for making logarithmic Grey Colour scales has been fixed.
2. BugFix (JRP/TB): Fixed several minor bugs in main program functionality, including maps, colour scales, themes. Also minor layout changes.
3. BugFix (JRP): A bug causing a map not to be saved on close has been fixed.
4. BugFix (JRP): A bug in scaled printing has been fixed.
5. BugFix (TB): A bug in the coordination of ViewData and the map has been fixed.
6. Update (TB): The program help has been substantially extended.

Module Geophysical Themes

1. Minor Change (TB): *Depth to Good Conductor* parameter Minimum layer thickness has been made optional.

CVES Import Module

1. Change (TB/JRP): Added positioning functionality – first release.
2. Minor BugFix (JRP): Fixed various minor bugs.

30.7.2003 1.2.6.241

Main Program

1. BugFix (JRP,JL,TB): Various bug fixes in program

TEM Import Module

4. BugFix (TB): All models were imported as *Minimum Depth* models with the Model.Model field in the Gerda database set to "1DDMIN1" instead of "1d-vertical". This bug has been corrected.

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Minimum Depth models are now only supported through the TEM model importer.

26.6.2003	1.2.6.234	Main Program <ol style="list-style-type: none">1. Change: Complete rewrite of workspace manager database and user interface. This release is not backward compatible with old workspaces.2. Change: Major changes in map functionality and user interface.3. Minor Change: Automated installation of service packs. Module Statistics <ol style="list-style-type: none">1. First official release of module Module Surface <ol style="list-style-type: none">1. First official release of module Module Geophysical Themes <ol style="list-style-type: none">2. First official release of module CVES Import Module <ol style="list-style-type: none">1. First official release of module Paces Import Module <ol style="list-style-type: none">5. Various patches and updates.
4.2.2003	1.1.5.92	Paces Import Module <ol style="list-style-type: none">1. Added check of number of channels in output.db.
14.1.2003	1.1.4.81	Main Program <ol style="list-style-type: none">1. Bug Fix (EA): A bug occurring when opening a new Gerda database was corrected. TEM Import Module <ol style="list-style-type: none">1. Bug Fix (TB): Plotting of negative db/dt values from processed data resulted in an error when plotting the data. This has been fixed.
17.12.2002	1.1.3.61	Main Program <ol style="list-style-type: none">1. New Feature (TB): The "Property" option on the right-click-menu on themes has been activated. See theme modules.2. New Feature (TB): The "show" and "hide" functions on the right-click-menu on Grid-images have been implemented, enabling toggling of images on the map without using the map layer control. PACES Import Module <ol style="list-style-type: none">1. Minor Change (TB): When not importing GDT files, the field FileNo in table PAMA is left blank.2. Minor Change (TB): When trying to import profiles with same name into one dataset, an exception is raised. Module Statistics <ol style="list-style-type: none">1. Change (TB): Redesign of form layout.2. New Feature (TB): Browsing of an existing theme by inspecting the properties used in the theme calculation. Module Geophysical Themes <ol style="list-style-type: none">1. Change (TB): Redesign of form layout.

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2. New Feature (TB): Browsing of an existing theme by inspecting the properties used in the theme calculation.

3.12.2002 1.1.2.51

PACES Import Module

1. Bug Fix (TB): A relation between tMaster and tProject caused only the first GDT file listed in the Paces table Project.db to be imported, ignoring the rest of the files. The bug has been fixed.
2. Bug Fix (TB): When mapping the roll-on/roll-off TIC values to SonID domain an error occurred, causing some SonID's not to be imported thus causing an error when trying to import the related SIP database. The bug has been fixed by applying a buffer of 8 SonID's at the start/end of a profile line. The value of 8 comes from the assumption of a min. sounding distance of 5 meters and max. distance between configuration centres of 40 meters, thus giving a lag of $40/5=8$ SonID's.

12.11.2002 1.1.1.41

PACES Import Module

1. Bug Fix (TB): A bug in the reading of raw GDT files causing a range check error has been fixed.
2. Bug Fix (TB): A bug in reading of TIC values from Tic-loc file has been corrected.

02.10.2002 1.1.0.34

Main Program

1. New feature (EA+LN): Queries can be made on a GERDA database and shown on the GIS map as points.
2. New feature (EA+LN): A Query can be gridded and the image shown on the GIS map. The gridding procedure uses standard Surfer grid files. Grid images are created using standard Surfer lvl files. These features are contained in the Surface module.
3. New feature (EA+LN): Queries can be shown on the GIS map as coloured points (mif themes). Colures are determined using a standard Surfer lvl file.
4. New feature: Geophysical themes (e.g. clay thickness and average resistivity maps) can be created from any query from a GERDA database. These features are contained in the Surface, Statistics and Geophysical Themes modules.
5. Bug fixes (EA) numerous bug fixes on the Workspace Manager.
6. Change (EA). The Workspace database has been redesigned. Old Workspace database can not be upgraded.
7. Changes in module: ImportTEM.

TEM Import Module

1. Minor Change (TB): Writing of TEM data tables has been optimized.
2. Minor Change (TB): Change of TEM progress bar layout
3. Minor Change (TB): All TEM import windows now appear center of desktop.
4. Change (TB): Comments in the Logfile and in Note fields of Gerda tables Model and Dataset has been redesigned.
5. Bug Fix (TB): The automatic rollback on import error and Undo function has been fixed.
6. Bug Fix(TB): An error occurred when reading TEM-files where data values were separated by only one space. This has been corrected.

PACES Import Module

1. First release of module

Module Surface

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3. First release of module in beta version

Module Statistics

1. First release of module in beta version

Module Geophysical Themes

1. First release of module in beta version

07.05.2002 1.0.9.13

Main Program

1. New feature (EA): Workspaces created with older version of the program is now automatically upgraded to the newest version.
2. Bug Fix (MH): A referential constraint between Gerda tables ODVMODSE and DATASET has been corrected.
3. New feature (EA): The workspace now contains its own registration database parallel to the windows registration database. The database is used to store settings common for the Workspace.
4. Change (EA): The design of the Project Management window has been changed in order to make it easier to read all settings. The Project Management window now also contains settings for PACES data and instrument.

TEM Import Module

1. Change (TB): It is now possible to unselect an item in the listboxes by holding down the CTRL key while pressing the selected item with the mouse.
2. Bug Fix (TB): A memory leak has been fixed. The leak caused the program to break down after importing a couple of hundred TEM soundings.
3. Bug Fix (TB): Fields "Software" and "ModelType" in Model table are corrected to lower case.
4. Bug Fix (TB): The main form window is now made inactive while importing a sounding.
5. Bug Fix (TB): An error in the undo function in association with new database has been corrected.
6. Bug Fix (TB): An error associated with reading older versions of the SiTEM database has been corrected.
7. Bug Fix (TB): Undo information was not cleared when starting a new import project directly after another. The undo information is now cleared when new data are pointed to.
8. Bug Fix (TB): The "Cancel" button on the import settings form now works properly.
9. Bug Fix (TB): A check of TEM instrumentation has been added.

09.04.2002 1.0.8.12

TEM Import Module

1. Bug Fix (TB): The undo had an error when undoing an import of only EMO-files.
2. Change (TB): The "Ident" field of the Dataset and the Model Gerda tables is now added to the line in the logfile window. Also the "Dataset" and the "Model" fields in the Dataset and Model tables are added.

05.04.2002 1.0.7.11

TEM Import Module

1. Change (TB): When auto matching SiTEM data and EMO-files, only noise data and channels present in the TEM-files associated with the EMO-file are marked in the SiTEM box. If the user attempts to import channels from the SiTEM data not available in the TEM-files a warning is shown.
2. New feature (TB): Plotting of model response, processed and raw

Aarhus Workbench release history

data in both Rhoa and dB/dt has been implemented. Selection of which plot type to use is made on the preference form.

26.03.2002 1.0.6.9

TEM Import Module

1. Change (TB): When a new UTM-file, EMO-directory or a new SiTEM database has been loaded, and preferences has not been set, the user is reminded to set the preferences box when executing import.
2. Bug Fix (TB): Undo information was wrong when message "data has been imported" was shown and the user chooses not to import the already present data. This has been corrected.
3. Bug Fix (TB): Map is updated correctly when the "undo" function has been used.
4. Bug Fix (TB): Line is removed from log-window when undo is used.
5. Bug Fix (TB): Line is now added to import window when data HAS been successfully written to the database.
6. New Feature (TB): It is now possible to open old log files in the logfile window, and thus continue old projects. However undo information is not stored for old projects, only within each session.
7. Bug Fix (TB): When Sitem AI numbers are present in the TEM-files associated with the EMO-file, a unique link between the Sitem database and the TEM-files are present. To avoid misuse, picking is thus disabled in the Sitem box, if AI matching is enabled and present.
8. Bug Fix (TB): When undoing import data in the Table DSetGEIn was not deleted, this has been corrected.
9. Bug Fix (TB): When undoing an import a text file was placed in c:\temp, causing an error if this directory didn't exist. This has been corrected.
10. Bug Fix (TB): When importing the query to the Gerda database was not freed, this has been corrected.
11. Bug Fix (TB): When opening an EMO-file version 2.04, depth constraints were read uncorrectly, causing a range check error. This has been corrected.
12. Bug Fix (TB): An error in reading calculated forward responses were corrected.

22.03.2002 1.0.5.8

TEM Import Module

1. Bug fix (TB): Bug in reading of filters from SiTEM database corrected.
2. Bug fix (EA): Error plotting HMTEM data in the importer for HMTEM processed after January 1st 2002.
3. Bug fix (LN): Model in EMO file older than ver. 1.30 generated an exception in the model plot.
4. Change (EA): If the same sounding is imported twice, the importer now generates a warning.

21.03.2002 1.0.4.7

TEM Import Module

1. Bug Fix(TB): Bug in auto matching fixed
2. Bug Fix (TB): Correct error message handling the situation when a TEM file referenced in the EMO-file does not exist.

20.03.2002 1.0.3.6

Main Program

1. Change (LN): MapX runtime and software protection driver is installed automatically after installation of GGGWorkbench

TEM Import Module

1. New feature (TB): For data to be imported correctly you must

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indicate the Tem data type. This is done in the Settings window, on the Data Acquisition tabsheet.

19.03.2002 1.0.2.5

Main Program

- 1 New feature (EA): If a database pointed to by the GGG workspace is not found on the hard drive the database is removed from the GGG Workspace
- 2 Bug fix (EA): When reconnecting to a Workspace Data database the database could not be used because of an error in the database path string.
- 3 Bug fix (EA): Synchronization between the select tree and the sheets on the Project Management for has been fixed. The same applies on the extended project management window.
- 4 Bug fix (EA): Selections on the Project Management window, when applied using keystrokes were not updated in the GGG Workspace.

TEM Import Module

- 1 Bug fix (TB): AI numbers stored in TEM files are now used correctly to mark data in SiTEM listbox.
- 2 Bug fix (TB): Check has been added to control the format of the UTM file.
- 3 New feature (TB): New option in the settings window enabling and disabling matching based on SiTEM AI numbers from the TEM files.

13.03.2002 1.0.1.4

Main Program

1. First release of software

TEM Import Module

2. First release of module