



Release Notes

The latest release of Workbench 6.9 provides the tools to further enhance the processing and analysis of data to final inverted geophysical models. Continued improvements and new features provide faster processing, clearer 3D visualization, more in-depth exploration of your models and support for many new external colormap and grid formats

New functionality includes data processing filters that remove outliers and maintain accuracy against variations in altitude, current, speed, pitch, and roll.

Geosoft grid and voxel compatibility improves visualization across platforms by importing and exporting 2D grids and 3D volumes in Geosoft formats, making it easy to share and collaborate across Workbench, Oasis montaj and Leapfrog.

Workbench's 3D viewer now enables Depth of Investigation (DOI) visualisation of 1D models, allowing users to apply transparency to areas beyond the reliable data depth, offering a clear view of model reliability.

Improved plot synchronization, data selection, colormap support, and text size management make visualisations and export more manageable.

Speed up dual-moment processing time with simultaneous selection and removal of interferences in both high and low moments, with the new Interval tool.

Workbench 6.9 brings tangible data analysis improvements through improved processing tools, filters, 3D visualisations, chart options, and much more.

Table of Contents

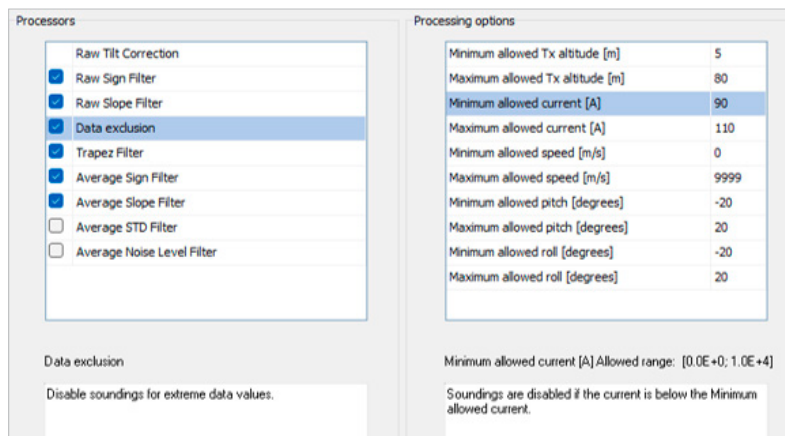
New and improved features in Workbench 6.9	2
Processing filters	2
Geosoft grids and Voxels	2
TEM IP theme	2
Views improvements	3
Interval tool	3
3D Filter DOI	3
Chart export	4
Colormap management	4
AGS Workbench Release History	5

New and improved features in Workbench 6.9

Processing filters

New TEM data exclusion processing filters improve data cleaning efficiency, leading to more accurate models for analysis.

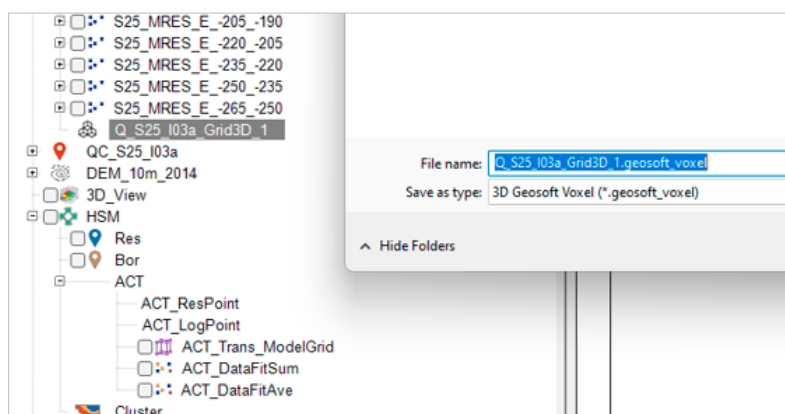
- **Robust Filters:** Implement min/max thresholds for altitude, current, speed, pitch, and roll, to isolate and remove outliers and ensure data integrity.
- **Selective Data Exclusion:** Set altitude and instrument parameter limits to automatically screen out irrelevant or low-quality data points.
- **Flight Dynamics:** Filter out readings affected by extreme pitch and roll angles to maintain the accuracy of the data for reliable interpretation.



Geosoft grids and Voxels

Import or export 2D grids and 3D volumes into Geosoft formats

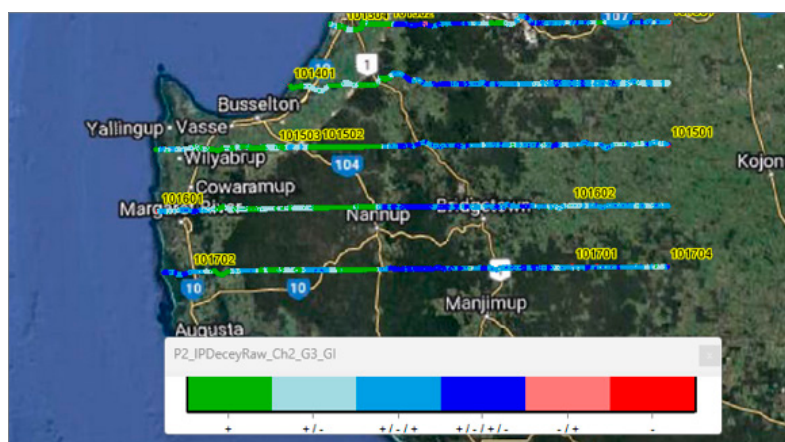
- **2D Grid Support:** Import and export 2D grids to the Geosoft grid format for easy visualisation between Workbench, Oasis Montaj, and Leapfrog.
- **3D Voxels Support:** Import and export 3D grids/voxels to the Geosoft grid format for easy visualisation between Workbench, Oasis Montaj, and Leapfrog.



TEM IP theme

Automatically categorise TEM IP data to simplify data analysis and interpretation

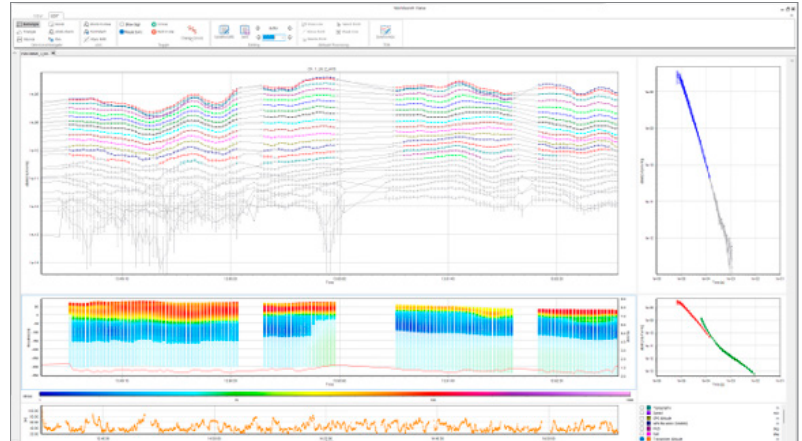
- **Six-Fold Classification:** Effortlessly sort data into six distinct IP effect categories to quickly correlate lithology to TEM IP data.
- **Colour-Coded Visuals:** Recognise geological contrasts and delineate regions with an intuitive, colour-coded GIS interface.
- **Comprehensive Analysis Range:** The full spectrum of TEM IP data is categorised, from consistently negative to exclusively positive.



Views improvements

Improved plot synchronization and data selection

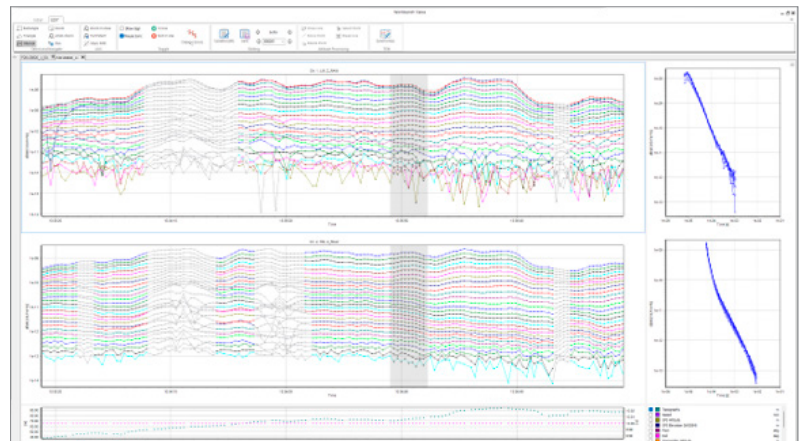
- **Highlighted Plot Settings:** Workbench now emphasises the settings associated with the active plot, providing a clear visual cue.
- **Synchronised Model-Data Interaction:** Selecting data automatically syncs with the corresponding section of the model soundings, removing the need for manual correlation.
- **Bidirectional Data Sync:** Choose a model segment and instantly view related data and decays, enabling a more efficient analysis and iteration process for model refinement.



Interval tool

Streamline dual-moment data processing

- **Dual-Moment Coupling Management:** Simultaneous selection and removal of interferences in both high and low moments halves processing time and enhances data integrity for all subsequent analyses.



3D Filter DOI

Depth of Investigation (DOI) Visualisation in 3D Viewer

- **DOI Visualisation and Transparency:** Workbench's 3D viewer now enables DOI visualisation of 1D models, allowing users to apply transparency to areas beyond the reliable data depth, offering a clear view of model reliability.
- **Dual DOI Calculation:** Select from standard or conservative DOI calculations to tailor the visualisation of data trustworthiness in your models.

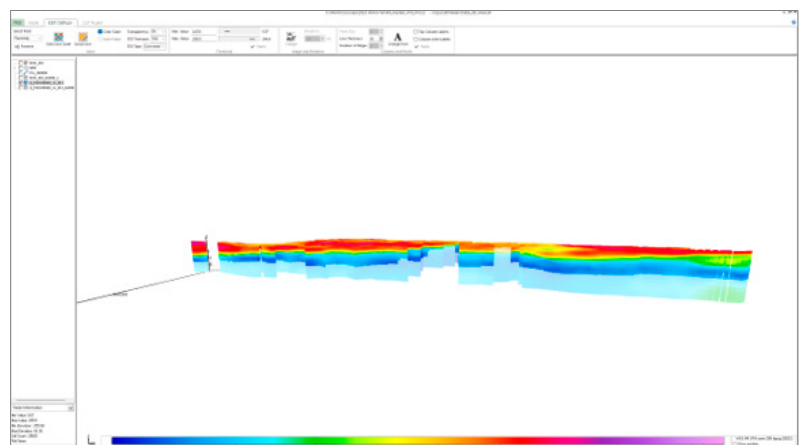
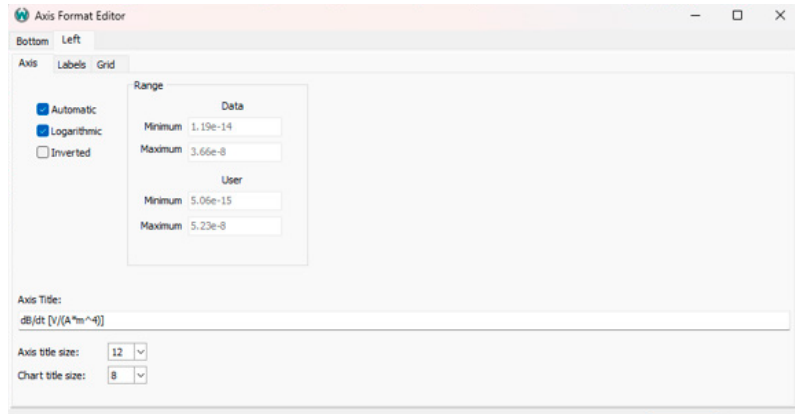


Chart export

Clearer Exports with New Chart Graphics Settings

- **Customisable Graphics Settings:** Set the text size of axis labels, axis values, and chart titles to ensure high-resolution graphics remain legible when exported to PDF.
- **Universal Application:** Implement these readability enhancements across all Workbench plots and charts for consistent visual quality.

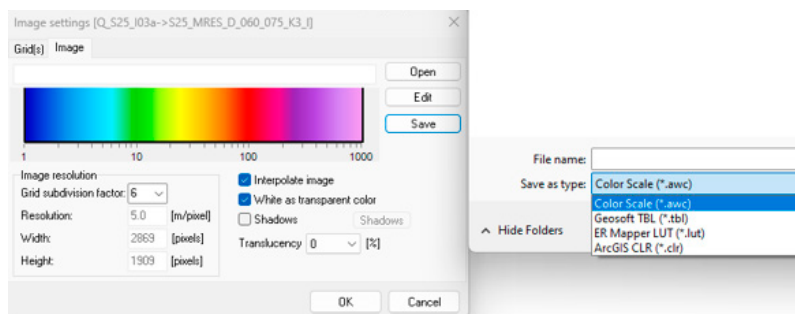


Colormap management

Manage colourmaps with the ability to load and save them in various formats, ensuring consistent colour scale representation across different software, simplifying your visualisation process.

Supported formats are:

- Geosoft TBL format
- ER Mapper LUT format
- ArcGIS/Surfer CLR format



AGS Workbench Release History

■ **DATE 14.12.2023, VERSION 6.9.0.0 WS88**

New Features

- 3D viewer: DOI Transparency and Type dropdowns can now be used for display of 1D models, instead of using hardcoded DOI.
- Support for load and save to external colormap formats:
 - Geosoft TBL format
 - ER Mapper LUT format
 - ArcGIS/Surfer CLR format
- Support for import of Geosoft 2D grids and 3D voxels.
- Export of 2D and 3D grids to Oasis Montaj and Leapfrog.
- New theme for TEM IP data: Auto create theme to categorize TEM data with IP effects into 6 categories for display on the GIS interface:
 - All data in is negative
 - Sign change positive → negative detected
 - Sign change positive → negative → positive detected
 - Double sign change positive → negative → positive → negative detected.
 - Sign change negative → positive detected.
 - All data is positive
- New processing filters for TEM data:
 - Min/max current
 - Min/max speed
 - Min/max pitch
 - Min/max roll
 - Max noise level
- Possibility to change font size for axis labels, axis titles, and chart titles.
- Improvements to the data processing selection tools for processing and sounding display:
 - The new Interval tool selects all data within an interval, and does so across multiple data plots if they are visible and synced.
 - Holding shift and then selecting (with either rectangle or interval selection) shows selected positions on the sounding plot. It no longer also selects the data - instead it uses a shadow to indicate the selected positions.
 - It now also works on models. When sync is enabled it will also show the soundings of the data that contributed to those models and they can then be edited directly.
 - Holding both shift and ctrl and then selecting is now used to add more to the sounding plot, thus it is now possible to show two individual soundings without showing all the soundings in-between.
- Possibility to manually import a finished cloud inversion, if import has failed.
- Views: For any active plot, the corresponding settings are highlighted in the settings list.
- Polygon on GIS: When creating a new polygon, automatically add a label on GIS with the polygon name.
- Show Inversion Result: Show lateral constraints on start modes for IP inversions.
- General Model Import: Support for import of DOI for IP parameters.
- Model Selection: Possibility to distinguish models on model type (IP/layer parameters).
- tTEM xyz processing: New default settings.

Corrected bugs

- tTEM inversions could not be added directly to sections.
- GCM/HEM SCI: Area could not be selected via polygon.
- In some cases, large inversions (~200,000 models) could not be imported correctly.

- HEM inversion: In some cases, inversion of soundings containing channels with a data value of exactly zero could not be imported correctly.
- AEM processing: When reprocessing, the relocation of GPS in x-direction would not be applied if settings were loaded from file.
- AEM import: Using a .ge2 format geometry file did not work.
- Processing a small interval of very closely spaced TEM data could in some cases result in an error.
- Trying to 2D grid an empty Model Selection node would result in an error instead of a useful message.
- 2D grid properties: Some properties were not saved correctly.
- Import of ABEM Terrameter database: Skip empty tasks instead of throwing an error.
- ERT Show Inversion Result: Fixed triangulation error for coinciding points.
- General model import: Allow mismatch between EPSG on user interface and settings file – show a warning instead of an error.
- Model export: In the header, 'Inversion data space' would for some model types be empty if the inversion was linear.
- Sections: User added title would be remembered across workspaces.
- Sections: Show Data for inversions: Multiple models did not open in the same window, and the numbering/names of the individual models was not correct.
- 3D viewer: In some cases, it was not possible to add .tiff images to 3D viewer.
- Reapply geometry: Changes to system response when applying new geometry wasn't effective immediately.
- Automatic logarithmic colorscales on themes did not work properly if values were smaller than 1.
- Views: Loaded settings would in some cases not respect 'visible' setting on Aux plot.
- Views: Current was not shown correctly in Aux plot for dual moment data processed in distance.
- Views: Improved handling of titles when loading settings.
- Views: DateTime axes could not be inverted.
- Views: Only export visible plots to image.
- Show Properties for Tempest inversions did not display the correct Additional parameters used for the inversion.

06.07.2023, V.6.8.0.0 WS88

New Features

- Licensing through Seequent ID.
- New image viewer: View all your depth/elevation slices, or other GIS model themes in a new viewer in 2x2, 3x3 or 3x4 grids.
- New SCI a-priori option: A-priori from Model Selections.
- HSM: Calculate silhouette index from clusters.
- Model Quality, TEM inversions: Display actual gate number instead of counter when creating Data themes.
- AEM: Data theme showing raw vs average data locations.
- Model Export: Support for Leapfrog borehole format.
- Possibility to save a geometry file from View Geometry.
- Views: Synchronization tool for disabling data across channels.
- Views: Possibility to hide menu/toolbar.
- Views: New keyboard shortcuts to move to next Line or Buffer interval.
- Views: For Data/Model views, default buffer position is where the first model is.
- Views: Showing model positions on GIS can now be turned off from the user interface.
- Views: Show data scope in buffer window.
- Inversion: Increased coordinate precision.
- Inversion: Decoupling of coordinates for cloud inversion.
- 3D gridding: Select resistivity, conductivity and/or IP parameters for gridding.

- 3D viewer: Possibility to show conductivity for 1D models.
- TEM Loupe import: Allow non-existing gate open/close times.
- New TEM processing filter: Tilt correction of dB/dt data (before, this was always done).
- TEM inversion: Improved error message if waveform is not valid.
- TEM inversion: Choose interval for inversion in distance, if processing is in distance.
- TEM inversion: Log when data is discarded to due line file.
- Apriori from GIS xyz file: Significant speed-up.
- SkyTEM/tTEM skb import: Skip empty files.

Corrected bugs

- Views: Bugfixes for inversion without DOI.
- Views: Bugfixes for inverting chart axes.
- Views: For GCM/HEM inversions including phase, the label on the y-axis would be wrong for phase data (display problem only).
- Views: For HEM inversions, show Altitude and Altitude A-priori in Model Parameters.
- Views: For TEM data processed in distance, inversions would show the wrong profile distance.
- Views: Bugfixes for soundings axes.
- Views: Improved loading of settings file.
- Views: Improved names in AUX groups.
- Views: Do not revert axes to default every time a new model is selected.
- Load inversion settings: Do not allow mix of model types.
- 3D gridding: For linear node thickness, the grid would be missing the top layer.
- 3D gridding: DEM was missing when showing properties.
- Model selections from multiple databases could not be added to sections.
- 3d gridding: It was not possible to save settings when viewing properties.
- Model Quality for SCI nodes: Don't display 3D grids in node list.
- Model Quality for SCI nodes: Altitudes were not visible.
- 3D viewer: Display of max elevation in info box was showing max elevation of first layer bottom instead of first layer top.
- 3D viewer: Draping an image on a grid in the resulted in a black image.
- Colorscale editor: Bugfix for editing a colorscale with a very large grid.
- Edit display for bitmap didn't show the colorscale associated with chosen image on Grid tab.
- TEM and ERT: Better error handling when trying to access processing nodes where the corresponding database had been deleted.
- Show Inversion Properties: Inversion type not shown correctly for ERT inversions.
- ERT pole-dipole: Remote electrode would sometimes be placed on the wrong side of the profile.
- ERT pole-dipole: Remote electrode to the left side of the profile combined with UTM coordinates in .dat file (not .ewp file) would result in wrong UTM coordinates.
- Exported Surfer grids can now be opened in Oasis Montaj and Leapfrog.
- AEM xyz import: In some cases a single data point could be lost at the end of lines due to rounding error in automatic line file generation.
- Sections: Edit colorscale did not work for models imported through General Model Import.
- Sections: Creating profile from inversion in reverse data recording order now uses profile distance for data without timestamp.
- SPIATEM LCI export: Inversion node name was missing in file header, and source type was wrong.
- GCM/HEM inversion export: Number of used data poi
- Update geometry: Gate times were in some cases not shown correctly for multiple moment data.
- .las file import: Skip empty lines.
- General Model Import: Bugfix for auto-mapping of files exported from older versions of Workbench.

- General Model Import: Removed restriction of 99 as maximum on ResSTD.
- General Model Import: Unit conversion was wrong if chosen import unit was S/m or mS/m.
- General Model Import: Imported residual could not be shown on Sections.
- Digital Elevation Model: Bugfixes for reading of very large grids.
- Borehole import: Bugfix for import of boreholes from GEUS Jupiter databases.

■ **19.12.2022, V.6.7.1.0 WS88**

Corrected bugs

- License server security update.
- TEM data export: First channel was missing the number of gates column.
- TEM processing: On reprocessing, only overwrite user edited altitudes and topography if GPS shift has changed.
- FEM data export to gdb: Columns were not sorted correctly for data with both quadrature and phase.
- Model export (XYZ by layer) was missing decimals on coordinates.
- Views: In some cases, the last line would not be visible in line number dropdown.
- Views: User edits of altitudes did not work properly for processing in distance.
- Views: Deleting and recreating a View with the same name could in some cases cause an error.

■ **27.09.2022, V.6.7.0.0 WS88**

New Features

- Views: Show TEM data in distance (instead of time) for processings in distance.
- Views: Possibility to use easting/northing as axis labels.
- Views: Synchronize selection between plots.
- Views: New options in right-click menus.
- Views: Synchronized vertical line marker following the mouse.
- Views: New data selection tool – triangle selection for easier disabling of data with lateral expanding noise/couplings over time.
- Views: Auto Center Map tool now also applies to models, making the GIS map center around the mouse location on a model.
- Views: Find Nearest tool now also applies to models. Use the Find Nearest tool on the GIS map to go to the closest located model in Views.
- Views: Possibility to set buffer size and start manually.
- Views: Possibility to have data view open together with data processing form.
- Views: Possibility to show dB/dt data in V/m².
- Isolines: Create maps layers with isolines for bitmaps.
- Model selection: Support for model selections across several EPSGs.
- SCI: Support for keeping SCI inversions in memory.
- Import: Support for Geosoft gdb format for airborne and groundbased TEM, and GCM/HEM.
- Export: Support for Geosoft gdb format for inversions (all data types), airborne and groundbased TEM data, and GCM/HEM data.
- Export: Export time stamp where available (TEM data and models).
- Export: New option to export TEM data with all moments for a given time stamp as a single line.
- HEM: When adding data node to GIS, an extra layer containing line numbers is added.
- 3D viewer: Keyboard controlling camera movement.
- 3D viewer: Significantly improved performance for adding and removing layers.

- 3D viewer: Added strafe in xy-plane.
- 3D viewer: Added min/max elevation to node information.
- 3D viewer: Possibility to add coordinates including elevation for TEM, GCM, HEM, and sERT data nodes.
- HSM: Added filtering for ACT nodes on cluster setup form.
- HSM: Support for export of clusters to Leapfrog format.
- HSM: Export data from ACT nodes.
- HSM: Include clay fraction uncertainty in export files.
- HSM Edit Data: After ACT run, exclude lithological logs which did not contribute to ACT calculation.
- HSM ACT run: Show current data fit and iteration time during run.
- HSM ACT properties: Show number of iterations and final data fit.
- HSM using uniform translator model (no lithological logs): Blind resistivity models with the selected blinding parameter.
- First Layer a-priori: For tTEM, sERT and GCM LCI inversions, only display first layer a-priori options if first layer info exists in data.
- Add Elevation Model: 'Use entire grid' option added.
- Model Quality: Support for altitude and a-priori altitude as elevation.
- Groundbased TEM: Possibility to import line numbers.
- AEM import to existing dataset: Do not delete existing line number info – instead add only the lines not existing already.
- AarhusInv version 8.30 released with the following bug fixes:
 - Modelling of front gate for source type 73 is changed for tTEM.
 - Fixed inversion crash if data has mixed source types 72 and 73.
 - Fixed inversion crash in new damping scheme.
 - More stable forward response for TEM-IP.
 - Throw an error if source type 73 type is used for TEM-IP inversion, since Laplace transform is not supported for source type 73.

Corrected bugs

- Views: On closing a view without saving, do not reload data unless the same data node is open in another view.
- Views: Never sync from Aux plot to Data plots.
- Views: Calculated speed for AEM xyz was wrong for data closer spaced than 1 second.
- Views: Interpolated bars blinded with DOI did not work correctly if either upper or lower DOI was missing.
- Views: Bugfix for model line plot in conductivity.
- Views: Minor ticks were missing on logarithmic axes.
- Views: Unit could not be changed SPIA TEM LCI sounding plots.
- Views: Map point mover error for model/model view with different EPSGs.
- View: Fixed an issue with topography for interpolated models view.
- 3D viewer: Middle mouse button should not trigger displacement of cut plane, if cut plane is not visible.
- 3D viewer: Scrolling mouse wheel during load would trigger an access violation.
- Sections: When creating Section from external grid, the auto-generated section layer was incorrect.
- New TEM processing: Require left/right was ignored if sounding distance was not used.
- AEM data export: Error if dummy was not numeric.
- AEM Reapply Geometry: Error if Data Quality nodes were present for the chosen dataset node.
- AEM Reapply Geometry: Reapplying geometry could cause error for databases containing both more than one dataset, and system response.
- SPIATEM SCI inversion: Error if all data for all channels was disabled for any stations.
- sERT processing: Deleting raw data had no effect on average data.
- Labels on GIS layers not visible until map update.
- Geosurfaces: Choosing a system color could prevent any profile from being reopened.

- Model Quality for GCM/HEM inversions: Number of data points in use was not counted correctly.
- Model Quality Data Residual was not calculated correctly for inversions done in linear space.
- Show Data (from GIS and sections) for newer model selections did not work.
- LCI inversion: Blocky settings were not saved correctly in registry.
- SCI inversion: UTM coordinates were single precision.
- Create Section from Models: Did not work for SCI inversions which are not SkyTEM data.
- Create Section from Models: Allow creation of sections from lines containing only two models.
- Edit drawing style of external gis layer did not work properly.
- Workspace upgrade: For large workspaces, Workbench could hang with 'program not responding'.
- Workspace upgrade: Save a backup of earlier versions when upgrading a workspace.

■ **17.03.2022, V.6.6.0.2 WS88**

Corrected bugs

- AEM processing: If trapez filters were used with no sounding distance applied, dispersion was not used to calculate average STDs.
- Groundbased TEM could not be inverted using SCI.
- HSM: Translator model grids in 3D viewer were shown with wrong sign for Z values for ACT calculations in depth.
- HSM: Z values for translator model grids in 3D viewer should be interval midpoint, not interval top.
- Loupe import: Don't skip line if elevation doesn't exist.
- Loupe import: Gave range check error if no lines with valid coordinates were found.
- Views: Loading settings with an invisible chart as active gave error.
- Views: Calculation of auto min/max on linear axes was wrong for negative values.
- Views: Fixed 'Duplicated not allowed' error for deleted nodes.
- Views – Model-Model: Create sounding could in some cases give an argument out of range error.
- Views – Model-Model: When adding additional model, unit would not be visible until view was turned off and on again.

■ **24.02.2022, V.6.6.0.1 WS88**

Corrected bugs

- Renamed nodes could not be opened in Views directly from workspace tree.
- Bugfix for user altitudes in Views.

■ **16.02.2022, V.6.6.0.0 WS88**

New Features

- Views is a completely new tool replacing the old processing tool for EM data and also the old "Show results" tool for inversion models. With views the user now has more options on how to display data and models for processing and visualization. Views include:
 - Data View: For processing of data. Have up to 4 plots with data + sounding plots and auxiliary plot.
 - Data/Model View: For looking at resistivity models along with data. Data plot and model plots are synched for easy reprocessing of data.
 - Model/Model plot: For visualization of different inversion models. Possible to have up to 4 plots.
 - Auxiliary plot: Possible to have up to 4 plots for visualization of auxiliary data.

- Hydro Structural Modelling (HSM) module: New module that contains a 2-step semi-automated workflow to create hydro-stratigraphic clustering models by combining resistivity information from geophysical data and borehole lithologies. The two steps are Accumulated Clay Thickness (ACT) modelling to create a clay fraction model and a clustering routine to create a zoned model.
- New TEM auto processing tool for all TEM XYZ imports. Redefined auto processing tool with new features such as process data in distance and skip sounding distance setting. Includes existing known filters and description of each setting.
- Export of 3D grid in vtk format.
- Make model selections across several databases.
- SCI Layered from Smooth: Possibility to blind smooth model layers with DOI.
- Never allow deleting of dataset from database when deleting a data node.
- Lithological log pdf report available in English and Danish.
- AEM import: Ignore lines in .lin file containing only spaces.
- AEM import: Sanity checks for waveform and front gate in geometry file.
- AEM System setup: It is now possible to view the current geometry as a .gex file.
- AEM: Increase precision for gate times to support differences smaller than 1e-6.
- AEM: Significant speed-up for Add Elevation Model.
- AEM inversion: Skip soundings with no line number if line numbers have been imported.
- Significant speed-up for saving 3D viewer project.
- General Model Import: Possibility to import depth/thickness STDs.
- tTEM processing: Support for using other GPS processors than GP1.
- ERT inversion export: Include IP in dat file.

Corrected bugs

- Save map as image did not work.
- Do not allow multiple data nodes to point to the same dataset in database (all data types).
- Batch gridding: Fixed 'value lies outside grid range' error due to numerical noise.
- Add models to Section: Filter did not work for model selection nodes.
- Sections: Grid as line did not work for external grids.
- Sections: Allow negative UTM coordinates when loading profile points from file.
- Edit colorscale from Section layers: Data for histogram was not correct for IP layers (resistivity was always used).
- Sections Batch processing: When choosing both 'Synchronize selection' and 'Synchronize size and axes', axes were not synchronized.
- 3D grids on Sections: Did not work if elevation/DOI grids were not in map EPSG.
- 3D gridding did not work if data and map were in different EPSG.
- 3D gridding: Cutting with DEM did not work if DEM was not in map EPSG.
- 2D gridding of model quality point themes were not placed correctly if EPSG was different from map EPSG.
- Inversions and model selections were not placed correctly in 3D viewer if their EPSG was different from map EPSG.
- SCI Layered from Smooth option did not work for system response datasets.
- SCI a-priori from grid did not work if grid was not in map EPSG.
- AEM: Data themes could in some cases prevent creation of SCI nodes.
- AEM GIS layer for line number was not placed correctly if map and data were in different EPSGs.
- AEM Update System Setup: More robustness when applying a geometry file that doesn't match the data.
- Loupe import: Skip empty lines and sounding without coordinates.
- Loupe import: Add ramp off time to gate times.
- Loupe: Topography now correctly adjusted for instrument height.
- Polygon restricted license could in some cases prevent data export.

- Current was not exported correctly for tTEM, Groundbased TEM, MegaTEM and Tempest.
- TEM IP inversions files will now always be written out as Loop Type 72 as required by AarhusInv.
- Bugfix for converting UTM Zone and Datum to EPSG for coordinate system 'RT90 2 5 gon W (epsg:2400)'.
- Bugfix: 50% duty cycle DCIP data was only partially imported when using the ABEM Terrameter LS advanced processing.
- Bugfix: ABEM Terrameter LS advanced processing failed when specifying total IP decay length instead of using the automatic option.
- Invalid sharp inversion parameters in registry could in some cases prevent opening of the inversion form.
- Azure Cloud Cost button didn't work.

■ **15.06.2021, V.6.6.0.0 WS88**

Corrected bugs

- Sections: Bugfix for copying layers from master profile.

■ **11.06.2021, V.6.5.0.0 WS87**

New Features

- Aarhus Workbench is now using the embedded version of Firebird 2.5. The Firebird service is no longer in use and can be uninstalled.
- Support for import of Loupe groundbased towed TEM data.
- Support for import of Tempest data in ppm.
- Support for import of receiver pitch and roll for Tempest data.
- External databases are automatically copied into the workspace to ensure portability.
- A smooth SCI inversion result can now be used to create sounding specific layered starting models using the New Layered option.
- It is again possible to do SCI inversions of legacy SkyTEM data with bias.
- AEM processing: Additional security checks when saving processings to database.
- Batch on sections: Allow images to be created with fixed scale.
- Possibility to add topography to Model Selections from ERT LCI inversions.
- Lithology logs: It is now possible to use rock type identifiers with up to four characters.
- TatukGIS map component updated to avoid issue with some points in a layer not being visible.
- Mag module for HGG tMag data in debug mode.
- HSM (Hydro-Structural Modelling) module for clay-fraction and clustering in debug mode.

Corrected bugs

- AEM processing - Keep Raw Sounding Distance: Error if import file contains dummy altitudes values.
- Error when adding Profile as image to 3D viewer.
- Report could not be opened if the original template file was no longer available.
- Report tool: Map layers would get out of sync if changing page with preview off.
- Report tool: Fixed bug where map layer list in the report tool could turn up empty.
- Report tool: Added check so a PDF report cannot be created if a color scale is not selected.
- Report tool: Fixed error if A3 sized report is printed with "Microsoft print to PDF" function.
- Report tool: Fixed bug where profile dropdown could give error.
- Add DEM to section: Did not work properly if EPSG of DEM was different than EPSG of map.
- Streamed ERT processing: When using Keep Raw option, the quality flags were in some cases not preserved correctly.

- ERT data with electrode distance of less than 25 cm could not be inverted.
- ERT: Import of .dat files with UTM coordinates fails if the file contains less than 50 coordinate points and does not have a coordinate for each electrode.
- Show Inversion Result: Improved visualization of DOI blinding for DOI in the lower layers.
- When applying topography to Model Selection from GCM/HEM/sERT LCI, do not update topography of the data node.
- Allow empty lines in system response .sr2 files.
- Fixed issue where a tiff file is displayed completely black in 3D viewer.
- GroundTEM LCI models could not be imported to database after inversion.
- Trying to create a Model Quality node from an empty inversion would result in Workbench freezing.
- Upload to Gerda (Danish users only): Wrong Ident creation when first layer apriori option was used for smooth models.

■ **03.02.2021, V.6.4.1.0 WS86**

New Features

- New SCI apriori tool: Add apriori from LCI inversions with the same number of layers (resistivity, IP parameters, and altitude).
- System Response is now available for SkyTEM xyz data.
- Data Quality point themes for SPIA TEM data.
- AEM data export: dB/dt unit changed from $V/A \cdot m^2$ to $V/A \cdot m^4$, to have the same dB/dt units on data for exports from processing and inversion nodes.
- QC data and model themes: dB/dt unit changed from $V/A \cdot m^2$ to $V/A \cdot m^4$.
- Now automatically using Windows proxy server settings (if applicable).

Corrected bugs

- Reapplying geometry for AEM/tTEM would in some cases result in an access violation.
- Model Quality did not work for newer 2D ERT inversions.
- HEM altitude would in some cases be lost after update from Show/Edit window.
- GCM/HEM: Error for inversion of more than 10,000 models.
- Choosing certain (system) colors for point themes would cause a range check error when adding layer to GIS.
- Geosurfaces: In some cases a section could not be opened if a geosurface had been cut on the last point.
- ERT import: Bugfix for adding UTM coordinates for more than 1000 electrodes.
- ERT import: Bugfix for topography error in Pole-Dipole import in some special cases.
- ERT processing form could for some datasets not be opened due to a registry error.
- Upload to Gerda (Danish users only): Missing UTM zone and datum for SCI upload.

■ **09.12.2020, V.6.4.0.0 WS86**

New Features

- New tool: Create Data Quality point themes for data nodes to display data and auxiliary values on the GIS.
- SCI apriori from grid: Possibility to remove vertical constraints on resistivity and IP parameters when adding apriori on depth or elevation from bottom.
- Improved performance of ERT processing form for large datasets.
- Keep Model Selections in memory – no reload from database when accessing the same Model Selection repeatedly.
- New color scale tool: Create color scale as a HSI color model. Option to convert to RGB colorscale.
- New shadow tool for bitmaps. Add a shadow to bitmaps by changing altitude, azimuth and ambient light of the shadow.

- tTEM import: Calculation of individual sample factors for hardware channels.
- AEM/tTEM inversion: Improved inversion logs.
- SkyTEM System response inversion: Force inversion in linear space if one or more of the inverted data sets contain system response.
- AEM/tTEM: When adding processing nodes to GIS, an extra layer containing line numbers is added.
- AEM/tTEM: Automatic update of GIS layer if data is reprocessed.
- General model import: Possibility to automap several consecutive columns.
- Export: New XYZ format – each layer for each model has its own line. Used for import in e.g. Leapfrog.
- Export models in feet.
- Geophysical themes for layer parameters: Make themes for several layers at once.
- Register a license without restarting Workbench.
- GCM/HEM processing: Save processing settings from properties.
- GCM sps import: Use GPS fix value to discard bad GPS lines.
- Save last used colorscale for point themes in registry.

Corrected bugs

- Improved first layer apriori (tTEM/GCM/sERT):
 - The vertical constraints on resistivity and IP parameters for first layer is removed when using first layer apriori (both depth and resistivity).
 - When using first layer apriori on depth, the prior constraint on thickness is always removed.
 - When first layer data is missing, the apriori STD is set free.
- IP SCI inversion: Apriori STD on IP parameters was not written correctly to model file
- Tempest inversion: RxTx distance apriori STD value was not written correctly to mo2 file.
- SkyTEM import: Bugfix for import of skb files older than 2013.
- GCM/HEM processing: No average point would be created if the mean filter only included one data point.
- GCM/HEM data export: Would fail if exported immediately after data processing.
- Report tool: Bitmaps would occasionally turn black.
- tTEM: Bugfix for reading unfinished binary data (skb) files.
- tTEM import: Bugfix for importing data to existing data set.
- TEM SCI inversion properties: Keep negatives flag was not showed correctly.
- TEM SCI inversion properties: When saving settings, power law setting was not saved correctly.
- SPIATEM LCI nodes could not be added to 3D viewer.
- Improved logic for opening recent and user folders on colorscale selector.
- Improved handling of legacy lvi color scales.
- GTEM import: Bugfix for identical timestamps.
- GTEM import: Topography was not imported correctly.
- Point mover on GIS map would occasionally disappear on zoom.
- Upload to GERDA (Danish users only): Bugfix for upload of older data (before 2012).

25.08.2020, v.6.3.1.0 WS85

New Features

- License server security update.
- SkyTEM xyz: Support for loop type 73 (segmented loop with inverse Laplace transform).
- General model import: Support for import of data residual and total residual.

- General model import: Support for dummy resistivity in last layers (non-uniform number of layers).
- SPIATEM: LCI inversion for SPIATEM data. Possibility to select the order of TEM data.
- SPIATEM: Possibility to load/unload processing.
- SPIATEM: Possibility to auto disable negative data points during inversion.
- SPIATEM: Possibility to use halfspace start model.
- SCI: Possibility to add a-priori for IP parameters (GIS and grid).

Corrected bugs

- AEM LCI properties: Advanced configuration settings could not be opened.
- AEM SCI did not work with system response.
- tTEM import: Coordinates would not be imported correctly if sps file contained dummy/zero coordinates in the beginning.
- SPIATEM SCI: Selection of subarea did not work, entire area was always inverted.
- sERT processing: STDs from processing were not saved correctly.
- ERT Show inversion result: fixed bug where inversion model would not load due to sync error.
- ERT: Error when adding topography on import for pole-dipole data with negative coordinate for remote electrode.
- Fixed assertion failure when adding surfer grid as external GIS layer.
- Model selections from IP inversions could not be loaded.
- Bugfix for ABEM database importer not being able to load database in some cases.
- Various minor bugfixes for ABEM Terrameter LS Advanced pre-processing.

■ **24.06.2020, V.6.3.0.0 WS85**

New Features

The LCI/SCI inversion setup has been updated and now comes with several new features:

- Cloud Inversion for faster inversion of large datasets, using Microsoft Azure Cloud as a pay-per-use service.
- Possibility to run Cole-Cole and Maximum Phase Angle for airborne and towed TEM data in SCI inversions.
- New LCI/SCI option for TEM with negative data: Keep, remove or remove from first negative data point.
- New LCI option to choose a subset of GCM/HEM data for inversion. Choose from profile distance or line number.
- New option to add a priori information for the 1st layer in SCI inversions for towed TEM, GCM and streamed ERT data.
- GCM/HEM: Possibility to invert for Phase for selected channels only.
- Add a half-space inversion to get a better starting model for SCI.
- Change between Smooth/Blocky inversion on copied SCI inversion node.
- New properties on LCI and SCI inversions: Possible to save settings to use for another inversion.

New updated GIS interface for improved stability, including better support for WMS, WMTS and WFS servers:

- New OpenStreetMap servers and Oracle Maps added as default.
- Possibility to add other servers from e.g. United States Geological Surveys, GeoScience Australia, and the Australian Geoscience Information Network.

See our wiki help page for the Workbench web layer tool for more information: http://www.ags-cloud.dk/Wiki/WH_WMSLayers.

The general model importer has been updated and now supports:

- Import of IP parameters.
- Import of data standard deviation.
- Delimiter option.

Other new features:

- 3D gridding: DOI is now always calculated for all layer parameters and can be visualized in the 3D viewer.

- Voxel inversion for airborne and ground based TEM is available in Debug mode.
- GCM/HEM import: option to average data with same GPS coordinates.
- GCM/HEM/streamed ERT: Export of raw data STD.
- SkyTEM import: Support for different sets of gate times for high and low moments.
- ERT/IP: IP data and forward calculations can now be exported for ERT/IP inversions.
- tTEM: Possibility to taper gates on import.

Corrected bugs

- GCM/HEM: It was not possible to invert for Phase.
- Streamed ERT: In some cases, reprocessing of older data would result in an error.
- Streamed ERT: On import, quality flags were not set properly for negative data.
- Colorscale editor: manually edited labels did not load when loading color scales.
- Report editor: Fixed map layer list disappearing after update.
- Sections: Interpolated models on sections can now be displayed with total length.
- Data export: Bugfix for workspaces containing more than one map.
- It was not possible to display properties for 3D grids.
- Batch image now adhere to preferences for image formats.
- Batch point themes and batch edit points theme now also work for external nodes.
- Image review was not working.
- Several bugfixes and improvements for import of lithological logs.
- GIS: Info tool was broken.
- Bugfix for applying DEM for ERT after import.
- DEM grids no longer transformed to map EPSG on import.
- Adding interpolated bitmap to section would fail for some model selections created from Res2DInv section grids.
- Upload to GERDA (Danish users only). Automatically remove double OmitGates entry on export of database.

■ **25.03.2020, V.6.2.1.0 WS84**

Corrected bugs

- SkyTEM xyz processing: Do not apply tilt correction to altitudes.
- SkyTEM skb import: Linefile was not applied correctly to newer data (2020 data only).
- tTEM import: Make sure to change sign on latitude if Northing = 'S', and on long if Easting = 'W' (G12 sps format only).
- tTEM import: Some depth sounder points would be lost on import if GPS data was more frequent than depth sounder data.
- AEM/tTEM export: data could not be exported from selected processing nodes.
- ERT processing: Changing the uniform data STD would not be saved for datasets without IP.
- General Model Import: Did not work when Layer Indication was set to 'Layer Thickness'.
- Batch gridding would occasionally use a wrong color scale.
- sERT Show Inversion Result: Last later properties would in some cases be wrong (display issue only).
- Adding Grid as Line to sections did not work if section layer name was different from grid name.
- Adding SCI constraints layer to GIS did not work for new EPSGs.

New Features

- New Pre-processing tool for ERT/IP data from ABEM Terrameter LS 2:
 - Estimation and removal of harmonic (powerline) background noise
 - Spike removal
 - Drift removal with exponential drift model
 - Gating of recorded IP decays with gaussian window shape

Read more here: www.ags-cloud.dk/Wiki/WH_DCIP_proc_DataSettings

- 3D gridding: Support for DOI blinding.
- 3D viewer: Support for DOI from 3D grids.
- New General Model import tool for import of models with support for DOI.
- New and faster colorscale editor with new features:
 - User defined number of tics.
 - User defined values of tics.
 - User defined format of tic values.
- SCI: Time for setting up a new SCI node decreased by 80%.
- AEM import: Time for importing AEM decreased by 75%.
- AEM inversion: Infile with data type dependent inversion settings (expert users only).
- AEM inversion: Automatically disable gates inside the front gate.
- GCM/HEM import: Support for Tie lines.
- GCM/HEM/sERT: 1st layer apriori on data visible on Edit form.
- Possibility to batch edit images.
- Possibility to create and edit images of imported external grids.
- Batch profiles:
 - Speed optimization.
 - New tool: Synchronize selection: show and hide the layers on the selected section if they exist on the master section.
 - Synchronize size and axis replace Synchronize.
 - Synchronize: Include the automatic axis checkbox setup from the master section.
 - Synchronized UTMX and UTM Y axis are now based on the length of the axis from the master section.
- New tool: Batch export from Model Quality nodes.
- Show inversion result: Possibility to show data sign.
- Possibility to export data and models to geographic coordinate systems.
- Upload to Gerda (Danish users only): Support for tTEM.

Corrected bugs

- AEM inversion: Show only line numbers existing in the current processing.
- Model Quality themes were not colored correctly in MapInfo mode.
- GCM/HEM: Do not reload processing if already loaded.
- GCM/HEM/sERT add topography: Did not work if data, grid and map were different EPSGs.
- Add elevation model to workspace would crash if grid and map were not in the same EPSG, and subsection was selected.
- SCI on ERT data did not work.
- SCI on sERT data did not work for more than 100 models.
- Geosurfaces: Drawing geosurfaces on profiles did not work properly.
- Geosurfaces: 2D gridding would crash if a profile had not been opened.
- Profiles: Some older profiles would give 'Unsupported parameter type' error when trying to open.
- Point mover sometimes disappeared from GIS when using edit form and sections.
- Bugfix in ERT Gerda export (Danish users only).

New Features

- Batch export of grids, point themes and bitmaps from inversion results.
- Batch generation of point themes and grid images.
- Batch editing of themes and point themes.
- Batch gridding: Possibility to not add layers to GIS after creation.
- Enabled export of large bitmaps (up to 65536 pixels).
- Add Model Quality themes to existing QC node.
- New functionality for applying extra STD to gates around sign changes for TEM data with IP effects.
- Support for IP parameters in 3D gridding.
- Creating sections from inversions: Merging sublines is now available for all datatypes, and the resulting section node names now have the correct number of digits in line number.
- GCM/HEM/sERT: Possibility to load/unload processings from memory.
- GCM processing: Separate running mean width for first layer resistivity and first layer depth.
- HEM processing: Separate running mean width and polynomial interpolation order for altitude.
- Keyboard shortcuts for GIS changed. See ags-cloud.dk/Wiki/W_KeyboardShortcuts for new shortcuts.

Corrected bugs

- GCM/HEM import: The last column in the column mapper could disappear when showing header lines.
- GCM/HEM inversion would in certain cases fail with 'INF is not a floating point value'.
- GCM/HEM: Update average data from Edit form could in some cases cause loss of 'Remove Negatives' flag, and negative data would reappear.
- GCM/HEM: Update topography would fail if topography grid did not cover the entire data area.
- GCM/HEM export: Powerline was rounded to too few digits.
- SkyTEM skb processing: Relocation of GPS to center of frame would in occasionally be slightly off.
- SkyTEM model export: For export of very large inversions, the channel numbers for high and low moment could be switched for some of the models.
- Possibility to generate a .gex. file from a .ge2 file containing only one moment.
- VTK to Model Selection: Error if VTK EPSG was different from map EPSG.
- Several minor fixes for import from ABEM Terrameter database.
- Borehole import: Error if first character in Rock Type identifier was a number.
- Workbench wouldn't start if it had been closed while minimized.
- Several bugfixes in connection with renaming of Sections.
- Upload workspace to ftp when reporting bugs is working again.
- Upload to Gerda (Danish users only): Support for SkyTEM minerals datatype.

New Features

- .gex import: New optional keyword 'RemoveGatesFrom' in 'Channel' section deletes the rest of the gates for this channel.
- .gex import: New optional keyword 'GateFactors' in 'Channel' section followed by comma separated string will add additional individual gate factors.
- .gex import: New optional keyword 'GateSTDs' in 'Channel' section followed by comma separated string will add additional individual gate STDs.

Corrected bugs

- VTK grid to Model Selection: Key violation when importing a grid more than once to the same database.
- VTK grid to Model Selection: For thin top layers, some points would not be visible.
- VTK grid to Model Selection: Improved speed.
- GCM/HEM import: Error when importing files containing datalines with dummy values for UTM coordinates.
- GCM/HEM reprocessing: When choosing 'Keep Raw Data' on reprocessing, filtering of negative data values was not reset.
- AEM SCI: Improved speed for writing tem files when a subarea is selected.

■ **27.05.2019, V.6.0.0.0 WS83**

New Features

- Aarhus Workbench is released in 64 bit (32 bit not supported anymore).
- 3D vtk grids may now be added to sections and used for creation of themes through model selection functionality.
- 3D viewer: Support for IP parameters.
- Support for import of ERT-IP data from ABEM Terrameter database.
- AEM processing: Possibility to add extra user defined STD around sign change for system response channels.
- AEM inversion: Possibility to select data for inversion based on line number(s).
- Considerably improved performance when reading DEM grids.
- SkyTEM skb and tTEM import: Default coordinate system on import form is now set to coordinate system of the map.
- GIS selection: New function 'Clear All' to remove all selections in all layers.
- Create New Processing: If a database node is selected, automatically select it in the database dropdown on the New Processing form.
- Import: If a database node is selected, automatically select it in the database dropdown on the import form.
- New node types to distinguish tTEM and xyz groundbased TEM from airborne TEM.
- ERT-IP: Support for import, processing, inversion, and export of integral IP only .dat files.

Corrected bugs

- ERT-IP export: Bugfix for export of full waveform IP data.
- ERT-IP inversion: MPA inversion of newly imported data would fail unless the workspace had been closed and reopened between import and inversion.
- AEM xyz processing: Several minor bugfixes for 'Keep Raw Sounding Distance' option.
- Show/edit AEM data: For older workspaces, plotting some values under 'Transmitter' could give a range check error.
- Show/edit AEM data: Processings with less than 10 average data points could cause a range check error.
- AEM inversion: Always invert for pitch if channels containing X data are selected for inversion.
- AEM import: Make sure primary damping factor is positive.
- AEM xyz import: Improved error messages when errors are encountered in alc file.
- Halfspace auto resistivity: Blocky (L1 norm) inversion setting would be overwritten with L2 norm when using halfspace auto resistivity.
- Show Inversion Result: Residual was always shown as logarithmic, even if inversion was run in linear space.
- Minor corrections to format for export of 3D grids to vtk files (Paraview support).
- sERT inversion: 1st layer a-priori was not used correctly.
- sERT export: Water depths and water resistivities were not exported correctly.
- Section layers with interpolated model bars did not have a colorscale.
- GERDA upload: '1d-vertical' identifiers in database were not lowercase, and inversions could not be uploaded.

- GERDA upload: Bugfix for addition of survey info to single site groundbased TEM (SPIA data).
- GERDA upload: Bugfix for upload of renamed ERT inversion nodes.
- GERDA download: Improved performance when loading models downloaded from GERDA.

■ **28.03.2019, V.5.9.4.0 WS83**

Corrected bugs

- AEM processing: When initially processing with GPS device 1 and then reprocessing with GPS device 2, the original processing was not deleted from the database.
- AEM processing: Keep Raw Sounding Distance setting was not stored to properties.
- AEM processing: For Keep Raw Sounding Distance, do not apply Trapez Min. No Gates filters and min/max Tx Altitude filters.
- AEM reprocessing: Keep Raw Sounding Distance setting is only allowed to change if all processors are reprocessed.
- AEM reprocessing: Always save to database after reprocessing.
- AEM inversion: Auto disabling of negative data was applied after count of number of gates in use.

■ **26.02.2019, V.5.9.3.0 WS83**

New Features

- Sections: Improved rendering quality of borehole labels. Labels have also been made slightly larger for improved readability. The font size can be changed using edit display.

Corrected bugs

- Sections: Labels on borehole layers were not visible.
- Sections: View Data from a selected model would show a line between forward response gates.

■ **19.02.2019, V.5.9.2.0 WS83**

Corrected bugs

- SCI inversion: Significantly reduced memory usage on writing models to database.
- SCI inversion: Bugfix for datasets using system response.
- 128 character path limit removed.
- ERT: User edits for IP STD were not saved to database and exported to AarhusInv.
- ERT import: Topography from surfer grid file did not work.
- ERT: Add Topography did not work.

■ **12.02.2019, V.5.9.1.0 WS83**

Corrected bugs

- AEM processing: Include uniform and user STD when calculating average data value.
- AEM processing: Keep Raw Sounding Distance was only visible in Debug mode.
- GCM/HEM processing: Noise data could cause very large STDs giving a range check error on Show/Edit form. When processing, impose a max of 99 on average STDs.

- GCM/HEM processing: If error bars were invisible on opening the Show/Edit form, chart would not update correctly when turning off data (required Update Edits).
- Inversion: Support for sections containing only one model.

■ **05.02.2019, V.5.9.0.0 WS83**

New Features

- New database structure for streamed ERT data with significantly improved performance for saving and loading data. Note that this database structure cannot be loaded from older versions of Workbench.
- AEM processing: Possibility to keep raw sounding distance, i.e. make the processed data a copy of the raw data (when importing pre-processed data).
- Aarhus Batch Inversion released. Use several servers/PCs for queuing and inversion jobs.
- New importer for Iris Instrument data. Support for Iris .bin files.
- Nicer ticks on logarithmic color scales with small numbers.
- Chart component updated.
- AarhusInv version 8.20 is released. Several memory issues fixed.
- ERT import: Topography may be read from data lines (type 11 only), dat file, topography file, or .ewp file. Topography from data lines is overwritten by any of the other types, each of which can be chosen on import form.
- ERT import: Possibility to import UTM coordinates from dat file.
- GCM/HEM/sERT import: Default EPSGs removed from import templates.
- GCM sps import: Don't load 'From EPSG' from import template even if it exists – it is already correctly set from lat- long coordinates in sps file.
- TTEM: Do not automatically disable negatives in .tem files.
- TTEM: First layer defaults on inversion form updated.
- Show/Edit form: Now by default showing error bars on raw data for GCM and HEM to be able to see negative data (shown by red color on error bars if Show Sign is enabled).
- Show/Edit form – speed: Now showing GPS speed for TTEM and calculated speed for AEM.
- TTEM/FloaTEM: Use median filter when processing water depths.
- Show/Edit form: Improved display of data channels of buffer form for AEM.
- Maximum Phase Angle Inversion enabled for airborne TEM and ERT data.
- Adding external grid to Section: Possibility to use individual color scales for different layer parameters.

Corrected bugs

- SkyTEM/TTEM processing: When CalculateRawDataSTD has been used on data import, never apply stacking STD to average data even if the raw STDs are small.
- HEM import: Importing line numbers as separate lines only worked for space/tab delimiter.
- Geosurfaces: When using the 'Move point' feature, the old point was not removed properly from database and would reappear when reloading the workspace.
- Geosurfaces: Last point on surface was lost on export.
- ERT processing: Processed datapoints would in some cases be slightly offset along profile.
- 3D grid: If Entire Area was unchecked on startup, checking it did not give the entire area, but only previously selected area.
- Show Inversion Result: DOI was not displayed correctly if inside last layer.
- Show Inversion Result: Significantly improved loading times for IP inversions.
- Show Inversion Result HEM: If some data points did not contain altitude, inverted and a-priori altitudes would appear out of sync on Show Inversion Result (display issue only).
- Show/edit AEM data: For selected workspaces, plotting some values under 'Transmitter' would give a range check error.
- Trying to import an external grid in an EPSG different from map EPSG would give an error.

- When selecting an 'Alias' EPSG, the EPSG value would in some cases be wrong and all coordinates transforms would fail.
- Occasionally, Workbench would hang when trying to open a workspace.
- Copy layers for Section: Did not work for interpolated model bar layers.
- Add SCI inversion to section: If the same profile layer name was used on different sections, all subsequent layers would be identical to the first (using the same xyz file on disk).
- Export of .dip files was broken.
- MergeGerda tool: Did not work for new EPSGs.
- Proper error message when SCI nodes cannot be created because data is linearly distributed (SPIA-TEM data).
- Proper error message when attempting to make a Model Selection from an Amira SPIA database without EPSG.
- TTEM: Add topography no longer requires SkyTEM license.

■ **18.10.2018, V.5.8.3.0 WS83**

Corrected bugs

- Fix of "Invalid typecast" error appearing in some cases for Show Inversion Result of xyz imported AEM LCI inversions.

■ **03.10.2018, V.5.8.2.0 WS83**

Corrected bugs

- Sections: Wrong ordering of certain layer types.
- ERT data import: Error for addition of topography.
- ERT inversion: Inversion error for newly imported data.

■ **24.09.2018, V.5.8.1.0 WS83**

New Features

- ERT data export: Possibility to export electrode UTM coordinates in .dat file.

Corrected bugs

- 2D ERT and ERT-IP inversions failed for data with offset on electrode positions.
- Zoom to layer on opening 3D viewer.

■ **11.09.2018, V.5.8.0.0 WS83**

New Features

- New Grid import tool. Support for VTK and Surfer grids. Add 2D sheets and profiles to section (e.g. from Res2DInv) and add 2D/3D grids to the 3D Viewer for visualization, comparison and thresholding.
- New generalized export form (all datatypes except ERT). Possibility to transform coordinates on export.
- Possibility to export raw and averaged data for GCM, HEM, sERT, and PACES
- SCI: Possibility to do SCI inversions using L1 norm ('Blocky' mode)
- Sections: Possibility to add full 3D grids.
- Sections: Performance improvements for adding models to section
- AEM import: When importing using the old geometry (.geo) format, a .gex file is automatically created in the same directory

- SkyTEM gex import: If using frontgate, make sure a front gate filter exists
- AEM gex import: NoGates is not required when data contains only one moment
- AEM processing: It is now possible to re-process Altitude without losing manual editing of data
- 2D ERT: now outputting uniformly spaced models, even if some soundings do not contain data
- ERT IP: The possibility of inverting using Integral Chargeability has been implemented for ERT IP data.

Corrected bugs

- Some Model Selections would appear more than once in the list on Add Models to Section form
- AEM/GroundTEM/TTEM processing properties. If Tilt/Altitude had not been processed, the properties for the processing node would anyway show that a processing device had been used
- SCI inversion: If a workspace contained processing nodes of more than one datatype, the default datatype for confile settings would always be set to the datatype of the last processing node in the workspace instead of the actual datatype being inverted
- SCI on SPIA TEM would fail because of a missing section in an inifile
- GCM sps import: In some cases, import would fail if the last line in the datafile was incomplete
- Sections: When adding models as interpolated bars, the DOI fading was in some cases added at the top instead of the bottom of the models
- Sections: When adding models as interpolated bars to a section in conductivity, resistivity would be displayed instead.
- Sections: Functionality for adding DEM grid to pofiles was broken
- Sections: When adding DOI lines, an extra point was sometimes added as the last point, making the DOI line go back and adding a point with value (0,0)
- Size of labels on borehole layers on sections was not saved properly, and any change in format would return the label to its original size.
- Export of SkyTEM xyz data with system response did not work ('Error in GenerateXYZFile').
- Gridding of geological surfaces was broken.

■ 19.06.2018, V.5.7.1.0 WS83

Corrected bugs

- SkyTEM import using .gex file: MeaTimeDelay was not added to gate times.

■ 11.06.2018, V.5.7.0.0 WS82

New Features

- Support for Cole-Cole and Maximum Phase Angle inversion for airborne TEM data (test-phase).
- DOI for all IP parameters are supported.
- Support for all IP parameters in Themes and Model Quality.
- Support for all EPSG coordinate reference systems for borehole module.
- New 3D gridding option of inversion models for 3D viewer.
- AarhusInv version 8.11 is released along with a new Advanced Inversion Settings (confile) editor.
- Generally improved performance for workspaces containing a large number of nodes.
- Adding external GIS layer: Support for Google Earth (.kml) format.
- Sections: Batch saving can now be done using png instead of bmp format, using about 100 times less disk space.
- Show and Edit data: Prompt for saving unsaved changes on closing window, instead of postponing the prompt until workbench is closed.

- PDF Report Tool: Addition of Show/Hide Preview button. Performance is greatly improved for large data sets when preview is hidden.
- TTEM: Support for importing filters as ASCII file during data import.
- SkyTEM xyz import: It is now possible to import disabled data (in-use flags).
- AEM: Import would fail if database already contained more than 25 data sets.
- AEM import: Support for new geometry file format (.gex) for all data types.
- GCM import: Support for data with both quadrature and in- phase in ppt.
- HEM import: Data file delimiter may now be selected on import.
- Standalone tool for merging models in different databases now working for SPIA databases also.
- New inversion form for Airborne TEM.
- Auto function for sharp inversion.
- Full parallelization for 2D resistivity inversion.
- Maximum number of model layers for smooth and sharp inversion increased to 40.
- Table added to inversion form.
- Possibility to show negatives for raw data in sounding plots.
- Histograms support IP parameters.

Corrected bugs

- Add Elevation Model: When adding surfer grids in ASCII format, the entire grid would be read from disk twice.
- PDF Report Tool: Under rare circumstances, copying a page in a loaded report would give an error.
- sERT: Addition of inversion nodes to 3D viewer would cause an error.
- When gridding using kriging, changing to Manual mode in Advanced Variogram Settings did not work properly.
- Sections: 3D grid layers from depth grids could be shown on depth axis sections.
- System response: Bugfix for sr2 files containing more than one time interval.
- AeroTEM: Bugfix for import and use of sounding specific waveforms.
- SSV: Auto Borehole Rating would give an error if the boreholes used were a subset of the boreholes in the Jupiter database.
- Error bars with negative data turned blue.

■ 12.02.2018, V.12.02.2018 WS82

New Features

- GCM/HEM processing: There are now 3 options concerning removal of negative data: 'Before processing', 'After processing', and 'No'.
- GCM inversion: Phase may now be inverted in debug mode.
- ERT: Support for elevation in .ewp files.
- Streamed ERT: Negative data are skipped on import.
- 'New SCI' button is always enabled.
- Show and Edit Data: Possibility to see data sign on data and soundings.

Corrected bugs

- AEM inversions: Inverted altitude was not loaded properly.
- Groundbased TEM: Inversion form could not be opened.
- VTEM/AeroTEM: SCI inversions using Shift could not be imported to database.
- GCM/HEM: Points disabled by processing were visible on Sounding Plot from Show and Edit Data.
- GCM/HEM: Older processings could not be loaded.

- GCM import: No restrictions on number of tabs/spaces in data file when <Space/tab> is used as delimiter.
- Streamed ERT: If dummy data were present for first layer depths in import file, processing could not be loaded.
- Streamed ERT: Data could not be saved from 'Show and Edit' form if 'Keep raw data' option had been used in processing.
- Iris Syscal import: Data with less than 20 IP windows could not be imported.
- ERT Show Inversion Result: In some cases, triangulation would fail because of coincident points.
- Sections: 3D grids in elevation did not have correct topography when added to Sections.
- Sections: Adding images to Sections didn't work properly.
- Sections: Improved the sorting on Create Profiles from Models for min/max x/y, so that it also creates continuous profiles for lines made from sublines (AEM inversions only).
- SCI inversions: Deleting an SCI inversion and recreating it with the same name could cause 'No connection to DBQ' error when creating Model Selections from it.

■ **27.12.2017, V.5.6.2.0 WS82**

Corrected bugs

- Bugfix in creation of new GCM SCI inversion node.

■ **22.12.2017, V.5.6.1.0 WS82**

Corrected bugs

- AEM data could not be processed using only one altitude processor.
- ERT import: Write EPSG to database.
- ERT import: Proper error message for illegal subarray types.

■ **19.12.2017, V.5.6.0.0 WS82**

New Features

- Support for all EPSG coordinate reference systems (in meters).
- New 3D viewer for visualization of data and inversion results.
- Support for SCI inversion of SPIA TEM data.
- GCM: Possibility to import water depth and resistivity, and using these as first layer a-priori information in LCI inversions.
- GCM: Import in sps format.
- GCM/HEM import log: Show number of imported data points.
- sERT: User defined delimiter in data files on import.
- LCI: Possibility to set max. number of allowed iterations for inversion.
- Several minor improvements to geophysical logs module.
- Sections: Possibility to show DOI when using interpolated bars.
- Sections: Synchronizing during batch processing now also synchronizes bottom axis type.
- Groundbased TEM: Disable all negative data in .tem files for inversion.
- AEM: If helicopter GPS speed has been imported, show this in Edit Data form instead of calculated speed.

Corrected bugs

- Bugfix in standalone tool for merging exported SCI databases.
- Sections: Fixed a bug that could in some cases cause an error in triangulation when adding 3D layers.

- Sections: Creating a section from an inversion/model selection worked for SkyTEM, but not for other airborne TEM data types.
- Sections: Section windows could not be minimized.
- 2D gridding of geological surfaces did not work.
- Deleting SCI databases in a workspace no longer prevents the workspace from being opened.
- GCM: Models could not be exported if dataset contained more than 10 channels.
- GCM/HEM import: Ignore data lines where coordinates are zero.
- AEM inversion: Do not write .tem files to disk if they do not contain any data in use (caused crash in inversion code).
- AEM inversion: Older workspaces using exponential waveform could not export .tem files.
- AEM: Processing nodes where processing was done using only GPS device 2 could in some cases not be loaded.
- AEM: Moving a dataset node in the tree could prevent inversion of its processing subnodes.
- AEM: Add topography on dataset node would cause 'invalid typecast error' if the dataset contained more than one (unloaded) processing.
- WMS layers: On opening a workspace, do not try to show layers if not connected to internet.
- ERT: Creating a new processing node would cause "Missing EpsglID value" error.
- Opening a workspace would sometimes give an access violation or 'abstract error'.
- Deleting grids and images, and recreating them with the same name resulted in the old images being used instead of the new ones.
- Model Quality nodes could not be created from model selections created from other model selections.
- Upload to GERDA: SCI inversions could not be exported to database for GERDA upload when profile layer with the same name existed (Danish users only).
- Upload to GERDA: Sharp inversions did not get the correct ident (Danish users only).

■ **04.08.2017, V.5.5.0.0 WS82**

New Features

- Sections: Support for adding geophysical (borehole) logs to sections.
- ERT: Support for adding topography to data after import.
- SkyTEM import: Updated import form.
- AEM processing: New filter for data processing ('Ave STD Filter') to be used for removing the rest of the gates when encountering processed data with STD above a threshold.
- AEM processing: Update of default processing settings.
- AEM processing: Buffer window did not correctly display 'holes' for time intervals with no data.
- AEM Data Shift: Possibility to apply factor/constant for all gates
- AEM: Support for import and visualization of battery voltage on and off times.
- tTEM: Support for import of Rwb files.
- tTEM: Support for processing of data with no altimeter and inclinometer data.
- SCI inversion properties: If area has been chosen by layer polygon, the layer name is shown in inversion properties.
- System Response (.sr2) files: Support for comment (//') in data lines.

Corrected bugs

- GCM/HEM import: Allow empty lines in data files.
- HEM import: Altitudes with dummy values in data files would cause inversion to give an error.
- GCM/HEM processing: When removing negative data, this is now done on processed data after averaging of raw data.
- SkyTEM import: Empty lines in mask file would cause import error.
- SkyTEM processing: Using data from both altimeters could sometimes give an erroneous processed altitude, if altimeters were located on the same side of the frame.

- AEM import: Do not require a front gate for LoopType = 3.
- AEM processing: GPS processing would give an error if GPSPosition2 was defined in geometry file, but data contained no GP2 data.
- AEM processing: If data was initially processed using a Digital Elevation Model (DEM) and subsequently reprocessed without the DEM, the DEM was not removed from the processing settings list – this could cause a database key violation.
- AEM Add Topography: An error would occur if processing was not loaded prior to adding topography to AEM data.
- AEM Add Topography: Elevation for points undefined in grid would in some cases be reset to zero even though 'Leave elevation unchanged for points outside grid' options was selected.
- AEM inversion: Disable gates which are too close to the waveform when writing TEM files for inversion.
- AEM inversion: On 'Select Data for Inversion' form, omitted gates are not by default loaded from registry. Load them manually from registry using 'Last' button.
- AEM inversion nodes: It is no longer necessary to load the corresponding processing when deleting AEM inversion nodes.
- AEM inversion nodes: Do not ask for confirmation for each node when multideleting AEM inversion nodes.
- AEM data export: Earliest gates would sometimes be omitted when exporting raw and average AEM data to xyz file.
- Show Inversion Result: Start Model Constraints was not loaded properly from database (always showed 99).
- Fix rare performance issue when creating Model Quality nodes.
- Themes: Bugfix for Mean Resistivity themes in Elevation.
- Themes: Do not create empty theme nodes.
- Batch Gridding: It would in some cases be attempted to write temporary files to the C:\Windows\System32 folder.
- Fix unchanged coordinate system after using coordinate transformation in General Model Import.
- Fix problem with reading coordinate system from external GIS layers.
- When deleting processing nodes, do not prompt for deleting the entire dataset for external database.
- Trying to export a section layer which was not visible on section form would cause an error.
- Sections: Adding a 3D grid to a section using Depth axis did not work properly.
- Sections: Error when trying to open sections containing older layers (< 2014).
- Sections: Fixed a bug when using coordinates or .prf files for creating profiles more than once.
- Adding SCI apriori from LAS files didn't work.
- MCI model export: Only one segment per position would be exported.
- Upload workspace feature was not working properly.

■ **05.05.2017, V.5.4.0.0 WS81**

New Features

- Import and visualization of borehole logs (LAS format).
- GCM/HEM: Export DOI with inversion results.
- GCM/HEM: Export STD also for dat files.
- GCM/HEM: Possibility to view Properties for a processing node.
- GCM/HEM: Support for systems with up to 20 channels.
- ERT import: For Syscal and GDD data, do not import data points where two electrodes have the same position. Skipped points may be seen in the import log.
- ERT export: Support for exporting pole-dipole data in dat and dip formats.
- Profiles: Possibility to choose interpolated bars when adding an inversion node.
- Profiles: Possibility to choose Depth as axis when adding a Model Selection.
- Export: Possibility to export Model Selection subsets created with Use Selection functionality.
- Model Quality: Support for creation of Model Quality nodes from LCI and processing nodes.

- Model Selection: Support for creating Model Selections from 2D ERT and ERT-IP inversions.
- sERT import: Possibility to add a GPS shift.
- sERT import: Support for import of Elevation.
- sERT import: Support for different data file delimiters.
- sERT import: Support for import of several data files at once.
- Possibility to make a local workspace copy of the database when connecting to an external database.
- Executables are digitally signed and timestamped to aid users and virus-scanners verify their authenticity.
- GIS: Added basic support for layers based on a Web Map Service (WMS layers).
- GIS: Mouse wheel scroll can now be used for zooming in the map.

Corrected bugs

- License: Fixed an issue that prevented some users from connecting to the license server.
- GCM/HEM/sERT: Sounding plot from Show/Edit Processing would under some circumstances not show the correct data.
- GCM/HEM/sERT: Import window could disappear on mouse click outside the import window.
- GCM/HEM/sERT: Import window was not scalable and was too big for a laptop screen.
- ERT: Creating a processing node right after import would sometimes result in a 'Layer could not be created' error message.
- Export: For export of AEM SCI inversions, forward data (_syn file) was not normalized by transmitter area.
- Model Quality functionality from inversion nodes was broken.
- Coincident points error from Delaunay triangulation would cause the workspace tree to freeze.
- Profiles: Adding an interpolated bitmap layer which was not the first profile layer caused a 'Cannot open file' error.
- Running more SCI inversions with system response at the same time caused an error.
- In some cases new workspaces did not get the coordinate system selected by the user.

■ 28.03.2017, V.5.3.1.0 WS81

Corrected bugs

- SkyTEM: When creating a new processing from data imported before version 5.3, STDs on raw data would be too large.

■ 27.02.2017, V.5.3.0.0 WS81

New Features

- New tool for creating PDF reports from a Workbench workspace.
- Support for import, processing, and inversion of streamed ERT data.
- ERT/IP: Support for import of Iris Syscal format.
- ERT/IP: Support for import of GDD format.
- GCM: New improved inversion setup.
- Show and Edit Processing (GCM/HEM/AEM): Significantly improved performance when selecting several points for Sounding Plot.
- SkyTEM: Support for calculating STD from raw stacks on import.
- ERT IP Processing: Significantly improved performance when updating charts.
- Sections: Profile Distance column added on export of Profile layer as xyz file.

Corrected bugs

- SCI: Allow zero a-priori STD on altitude for airborne TEM.
- SCI and LCI: A-priori STDs smaller than 0.01 m will be reset to zero.

- SCI: Deleting a top level SCI node would not delete all corresponding files and folders on disk.
- Show Inversion Result (GCM/HEM/AEM): Improved performance of model position explorer – no more blinking and redrawing when selecting models.
- Show Inversion Result (GCM/HEM/AEM): Closing the Model Parameters window would take a long time for large datasets.
- Show Inversion Result (GCM/HEM/AEM): The chosen color scale for the Model Section window is now saved in the registry.
- GCM/HEM processing: Always remove datapoints with value zero, also when keeping negative data.
- AEM topography: A number of points at beginning and end of flight would lose the topography after processing, even though topography was defined for all points in xyz file on import.
- AEM Show Inversion Result: Y-axis unit was incorrect for SCI inversions.
- AEM: SCI inversions did not work with System Response Convolution.
- AEM export: Data units were not correct.
- SkyTEM import using ge2 file: Definition of current interval would be wrong if the current of the first entries in the PaPC sps file were far from the final current level.
- ERT IP Inversion: Under some circumstances the lateral STD on Depth would not be saved.
- ERT IP Show Inversion Result: Bugfix for triangulation.
- Sections: Choosing 'Cancel' in Axis Properties would in some cases cause the error 'Unsupported Axis Type'.
- Sections: Bugfix for adding 3D grids with elevation.
- Sections: Deselecting all layers on an open Section would result in an error.
- Sections: Bugfix for creating new section from models – data without timestamps was not sorted correctly.
- Point Themes: Fixed a memory leak.
- Geological Surfaces: Deleting the top Geological Surfaces node would cause an error.
- Fixed synchronization error between workspace tree and GIS layer manager when creating new GCM and HEM processings.
- When choosing a colorscale on a section, the correct colorscale would not always be picked.
- The Chart tab is no longer automatically selected when it is available.
- Fixed dependency on legacy files needed to create grid layers on Windows 10.

■ **12.12.2016, V.5.2.2.0 WS81**

Corrected bugs

- Updated 3rd party component that occasionally caused problems when opening workspaces with ECW-files in the map.
- AEM: Occasionally, a device with number -1 would appear in the device list for GPS processing.
- LCI and SCI: When viewing properties for an inversion, the inversion settings would be saved to registry and be default for next inversion.
- SCI: Changed default values – now calculate DOI by default and do not by default automatically close SCEmbi.
- SCI: If license to a data module had expired, the SCI setup form could under some circumstances not be opened.
- GCM/HEM processing: If processing is cancelled, do not save settings to registry.

■ **21.11.2016, V.5.2.1.0 WS81**

Corrected bugs

- AEM: When plotting many soundings simultaneously, sounding plot would sometimes show both current and previously selected soundings.
- GCM: Sounding plots would for SCI display a checkbox for imaginary data, even though dataset contained no imaginary data.
- SCI setup: If there were errors in the settings when pressing Finish button, Finish button would be disabled and the entire setup had to be restarted.

- Show Properties was disabled for airborne TEM LCI inversions, if processing had not been loaded.
- Show Properties was disabled for SCI inversions.
- For LCI inversions using sections, inversions were under special circumstances run with an L1 norm minimization for some sections, even though L2 norm ("smooth") was selected. This produced more blocky inversions than anticipated with the L2 norm.
- AEM xyz import: Import would fail if device number 2 was defined in .ge2/.gex file without a device number 1 of the same type.
- AEM/SkyTEM import would crash when trying to write import log, if too many errors were encountered on import.
- SkyTEM import: Support for PaPc SPS files in TX3 format.
- Do not check license when viewing SCI inversion properties.

■ **07.11.2016, V.5.2.0.0 WS81**

New Features

- Support for connection to license server through proxy server.
- SkyTEM: Much faster reading of .ge2 geometry files.
- GCM/HEM: Support for import and visualization of Pitch and Roll.
- GCM/HEM: Improved Column Mapping Editor, including possibility to turn viewing of comment lines on/off.
- GCM/HEM: Mean Sounding Distance added to import log.
- GCM/HEM: Possibility to keep negative data when processing.
- Workspace wizard: Support for adding GIS layers from several other file types (mif, shp, tif, jpg, jp2, ecw).
- The profile x-axis can now be changed to display UTMX or UTMY coordinates instead of Profile Distance.
- Display of unit information added to color scale on map, and update of color scale improved.

Corrected bugs

- More informative message if workspaces cannot be opened because Firebird service is not running.
- HEM: Laser altitudes and inverted altitudes appeared out of sync in Show Inversion Result when 'Keep raw data' had been used in processing (visualization error only).
- HEM: Fixed some erroneous labels on importer.
- GCM/HEM: Mapping of Line Number column was not saved to import template.
- GCM/HEM: After processing with discarded negative data, it was not possible to get the negative data back when re-processing.
- Tab files could not be added to GIS.
- Airborne TEM: Better error handling when trying to invert time intervals with no data.
- Add Topography: Checkbox replaced with dropdown to clarify the options when a data point lies outside topography grid. Bugfix for GCM/HEM where topography could not be added if datapoints were found outside topography grid.
- ERT: Under special circumstances 2D inversion could not be shown.
- ERT: Bugfix for disabling IP. Sometimes the entire curve would be wrongfully toggled off.
- ERT: Graphical error when hiding toggled off points on IP Window fixed.
- Corrected a bug when opening a Workspace with old version GERDA type list.
- ERT: Bugfix for the DC InUse parameter when exporting
- .dip files.

■ 22.08.2016, V.5.1.1.0 WS81

Corrected bugs

- Inversions were run with an L1 norm minimization, even though L2 norm ("smooth") was selected. This produced more blocky inversions than anticipated with the L2 norm.

■ 17.06.2016, V.5.1.0.0 WS81

New Features

- Import wizard settings are now added to import log for airborne TEM and groundbased TEM xyz file import.
- Added import log for HEM and GCM.
- Sparse format used for AarhusInv to speed up inversions.

Corrected bugs

- Fixed a parallelization error for use of the last two CPUs in AarhusInv.
- Fixed a bug that would under rare circumstances result in the processed GPS points being distorted from the profile for HEM and GCM.
- Fixed a bug for conversion of coordinate systems when importing HEM and GCM data.
- Fixed an error in writing waveforms in DCP files for 1D and 2D DCIP inversions.
- Fixed a rare rounding error for DEM maps.
- Fixed a rare AarhusInv error where inversion would stop due to poor convergence.
- Fixed a bug in changing colors functionality for borehole databases.
- Changed format for layer names for Mean Resistivity themes ('m' used as decimal separator for layers with non-integer depths).
- Order Import and Workspace logs alphabetically.

■ 03.06.2016, V.5.0.5.0 WS81

Corrected bugs

- Fixed a bug in creation of bitmaps.

■ 02.06.2016, V.5.0.4.0 WS81

New Features

- New database structure for GCM and HEM data with significantly improved performance for saving and loading data. Note that opening GCM/HEM workspace will cause a workspace upgrade, meaning that workspaces cannot be opened in previous versions of Aarhus Workbench.
- New importer for GCM and HEM data, including possibility to add an absolute STD for each channel.
- Possibility to add user STD to HEM and GCM data.
- SCI GCM/HEM inversion properties: Show which data (Re/Im) has been used for inversion.
- Display Tx Altitude on HEM edit data form.
- GCM inversion: Do not allow inversion of Phase data.
- If no imaginary data is present, do not display imaginary data options on GCM and HEM Edit data form.
- GCM and HEM: SCI can now be created from the proc node.
- Support for System Response for SkyTEM data.

- Help function replaced by new online wiki help which is linked to Workbench and is called from any window by F1.
- Geological surfaces: Lines can now be broken.
- Geological surfaces: Lines can be exported.
- Parent nodes of Profile and Geological Surfaces can now be deleted.
- XYZ export for SCL inversions now includes a time stamp if it exists (for airborne TEM).
- ERT: Shift A/Q shortcuts: for removing the entire curve IP curve.
- ERT: Improved speed and stability in processing of IP curves.
- ERT: Constant phase angle (CPA) inversions for DCIP data implemented.
- ERT: Import of In Use Flags and STDs for DCIP data implemented for .dat files.
- ERT: Support for L1 inversion (new smooth option).
- ERT: Plot negative data by a red color.
- ERT: A checkbox is added for not showing the disabled IP points for both the processing and the results.

Corrected bugs

- Fixed 'Unknown axis type' error for displaying soundings curves and model sections for HEM data.
- Several minor bug fixes for HEM and GCM buffer size window.
- Order channels by channel number on GCM and HEM inversion form.
- Under given circumstances, NaN points could be allowed in use in inversion data files for HEM and GCM.
- Save selected channels for inversion to registry for GCM and HEM.
- If no changes have been made, do not redraw GIS layers when closing GCM and HEM Edit data form.
- Hide point mover on GIS when Edit data form is closed (HEM and GCM).
- Do not show Altitude parameters for Groundbased TEM Edit data form.
- Bugfix for loading GCM/HEM processing settings from file.
- Remove GIS point mover indicating model position when closing 'Show Inversion Result' form for GCM/HEM.
- Bugfix for 3D gridding of layers below 1 meter in thickness.
- Fixed 'Unknown device type' error for adding topography to airborne TEM processings.
- Case insensitive file extensions for geometry files for SkyTEM import.
- Fixed a bug in plotting of inverted models for xyz imported SKYTEM data.
- Fixed that bug that could in some cases cause a slight distortion of GPS coordinates for airborne TEM.
- Import of TEMPEST data: Set proper wave form type and don't perform any checks on wave form amplitudes.
- ERT: Fixed a bug in using Res2Dinv for inversions.
- ERT: Fixed a bug in opening the processing window directly after import.
- ERT: For inversions the DOI layers are now always 20.
- ERT: Fixed a bug for uploading raw data to GERDA (Danish users only).
- Interpolated bars added as an option for Model Selections on Profiles.
- Changes in shortcuts.
- Fixed a bug in upgrade the Workspace Database.
- SCL: The triangulation is moved to the end of the SCL wizard to minimize waiting time during SCL setup.
- Bug fixed when creating image of DEM after selecting region on GIS.
- Boreholes: Fixed a bug that prevented manually adding new and editing boreholes.

New Features

- Node renaming features are now available for most node types.
- Export xyz files for GCM and HEM inversions (LCI and SCI).
- Sections re-enabled for LCI inversions.
- Airborne TEM GPS processing: 'Reposition in x-direction' has been changed to 'Move GPS in x-direction from frame center', i.e. we now relocate relative to frame center instead of relative to GPS position.
- View Release History from File tab.
- Show length of a new profile while drawing on the map.
- Added more values to the drop-down list of standard deviations on the chart.
- Changed functionality of Zoom To Layer. A small margin between the layer and the edge of the map is added.

Corrected bugs

- 'Use Selection for' functionality fixed.
- Fixed 'No parameters stored for the ColorScale' bug that could occur when clicking on profiles in newly created workspaces.
- Fixed a problem with file processing that would prevent SCIs from running.
- Fixed a problem that prevented the database from rebuilding after inverting a new SCI node.
- Print out gate open times and gate widths in tem file for SkyTEM xyz format.
- When importing groundbased TEM models, only one model was shown on profiles.
- 'Auto scale resistivities'checkbox for SCI inversions was not set correctly with the value from registry.
- Bug fixed in show inversion result for SkyTEM data imported as xyz-files. This only affected models with no low moment and was only a visualization problem.
- Bugfix for deleting HEM and GCM models.
- Bugfix for 'Add Topography' functionality for airborne TEM.
- File extension is now case insensitive for geometry files.
- Added check for empty fields when reading data from shape files.
- ERT: Sounding distance for 2D inversions is now locked to be the electrode distance.
- ERT: Max resistivity is set to 95000.
- ERT bug fixes on the processing window:
 - 'Electrode Map Symbols'-button is removed.
 - Small fixes on the statistics tab.
 - Max slope on the processing tab now has more options.
 - The Pseudo Section is now automatically updated when the slope filter is applied.
- Fixed hot/down issue for buttons on GIS and Chart tabs.
- Bugfix for export of ERT data to MasterGERDA (relevant to Danish users).
- Solved issue that prevented SCI of GCM and HEM data from being written to database.
- Export model issue caused by invalid registry entry was solved.
- Exporting raw data would fail for workspaces with more than one map.
- Fixed adding grid layers to map on newly installed OS.
- The "gdal_translate.exe" was missing a file (MSVCP71.dll).

■ **12.01.2016, V.5.0.2.0 WS81**

New Features

- **New Workbench Viewer:**
Workbench Viewer mode is a free version of Aarhus Workbench only for showing already made themes and profiles. The target with this version is customers to our clients who only need to look at results, either during a project or final results. Contact us to get a free Viewer license.
- It is now possible to import GCM data in mS/m and ppt.

Corrected bugs

- Log of error messages after TEM file export for SkyTEM inversions added.
- Fixed an error that occurred when putting a SkyTEM LCI node directly on a profile
- Fixed a bug that would occur when viewing inversion results from the profile window.
- Hints are now also available on disabled buttons.
- Minor bug fixes issues on the user interface.
- Bug fix in create shape file from a borehole selection where drill depth is undefined for some boreholes.
- Fixed an error that occurred when setting VerticalRef of a borehole to 'None'.
- Profile distance for GCM was calculated incorrectly during import in case of coordinate system transformation.
- Bug fix in adding and editing Borehole database entries.
- 3DGrids added as Profile layers will now display the applied color scale. This color scale can also be edited on the profile window.

■ **09.12.2015, V.5.0.1.0 WS81**

New Features

- Creating Profiles from models can now be done in more directions.
- Workspace logs are now present on a tab alongside the workspace explorer.

Corrected bugs

- GCM/HEM: Do not display negative data or data which has been turned off by processing on the Edit Processing form.
- DEM: Minor changes in the adding topography window as well as DEM nodes in the Workspace are saved as binary files.
- Increased point size for layers based on shape files.
- Showing labels could make multi colored layers lose their color in the map.
- Tools on GIS ribbon were inactive on newly created maps.
- Bug fixed in coordinate transformation when adding a-priori from conductivity logs.
- Bug fixed in multidelete if both parent and children nodes are selected for deletion.
- Fixed license issue which prevented SCI inversions.
- Fixed license issue causing error when trying to unregister machine.
- Edit display is now possible for GCM and HEM data.
- Proper handling of creation of map layer when input contains no valid data points.
- New hints for the file tab.
- Minor graphical changes on the tabs in the main window.
- Bug fixed for workspaces with invalid coordinate systems.
- Bugfix for deleting GCM and HEM processing nodes.

■ **26.11.2015, V.5.0.0.0 WS81**

Aarhus Workbench 5.0 is now available for download at

- www.aarhusgeosoftware.dk

Online upgrade from 4.x is not supported.

Hardware dongles no longer supported – you will need a software license code available from

- Support@AarhusGeoSoftware.dk (International users)
- Support@geo.au.dk (Danish users)

The 5.0 installer runs a required upgrade to Firebird server 2.5.4.

The new major release includes several important changes:

- New intuitive ribbon user interface with significantly improved performance.
- Native GIS format changed from MapInfo to ArcGIS for significantly improved performance and portability.
- Default database engine changed from BDE to IBDAC for significantly improved performance.

Corrected bugs and minor new features:

- Note fields on workspace tree nodes would sometimes be displayed incorrectly.
- New databases could not be deleted before workbench had been closed (IBDAC only).
- The airborne TEM xyz importer no longer gives an error for empty lines.
- Fixed a bug that in rare cases could cause an inversion job to crash.
- Bug fix in opening workspace after auto-creating new profiles with layer.
- Workspace and AEM import log working again.
- Bug fix in adding models to profile when more than 50 inversions are present in the workspace.
- Importing a DEM node into a workspace now always transforms it to the coordinate system of the map.
- Adding topography from a DEM in the workspace will now always use the correct coordinate system.

■ **19.10.2015, V.4.2.15.1 WS81**

New Features

- Fixed an issue that would prevent the user from moving batches of data, i.e. when upgrading workspaces or creating DBQs.

■ **14.10.2015, V.4.2.15.0 WS81**

New Features

- Borehole Editor table may be exported as text file.
- Major revision of the import module for airborne TEM data (except SkyTEM).

Corrected bugs

- Significantly improved performance for saving processings for HEM and GCM.
- Workbench again supports spaces in the map node name.
- Creating new surface layers on profiles no longer results in errors and the new surface appears right away.
- An error would sometimes appear when moving data between database tables.
- Database queries would sometimes return a false record count.

- Fixed a bug that was causing problems with color scale in debug mode.
- Avoid QR5RunDXE access violation when creating borehole report.
- Fixed a range check error when opening Borehole Editor.
- Added a correction routine to restore a broken registry key.
- Fixed access violation caused by closing the ERT model viewer form.
- Fixed an issue that caused a crash if 'Cancel' was selected when adding a name to a new DBQ layer on a profile.
- Adding models to profiles directly from the inversion nodes no longer results in an error.

■ **14.10.2015, V.4.2.14.2 WS80**

Corrected bugs

- Fixed a bug that prevented user from editing color scale.

■ **14.10.2015, V.4.2.14.1 WS80**

Corrected bugs

- Fixed a bug that prevented data from being shown on some forms.

■ **20.07.2015, V.4.2.14.0 WS80**

New features

- First step toward a new GUI:
The Workbench Main Menu bar, the Workbench Explorer and the Map is now a single window.
Please note that this is the first release in a redesign process towards a more modern user interface. Further changes and enhancements are planned for future releases.
- Workspaces with databases in Access format (.mdb) can no longer be upgraded. This was done to prevent corruption of workspaces caused by operations on the databases unsupported by the Access format.
- SSV: Rating filter added on the borehole editor.
- Model exports for GERDA will now also include DOI when LCI nodes are exported.
- Significantly improved TEM start model estimation.

Corrected bugs

- SSV: Changed validation of dialog settings.
- SCI: Bug fixed in showing properties.
- GIS: Fixed bug where synchronisation of layer visibility from map legend to workspace manager failed for some layer types.
- GIS: Optimized the "UpdateFilter" routine that maintains and filters information in the GIS legend.
- TEM: Fixed bug in export TEM files, where a date comparison could cause export of a channel to fail.
- Bug fixed in showing coordinate system from the southern hemisphere when adding/editing borehole database.

■ **16.07.2015, V.4.2.13.0 WS80**

New features

- SSV: Added selection of data points based on a polygon layer.
- SSV Statistics changed to SSV Job Summary and run time, data and total residual added to the shown list of values.

Corrected bugs

- Bug in updating map in ERT module which slowed everything down.
- Bug fixed in upgrading certain SSV nodes.

■ 14.07.2015, V.4.2.12.0 WS80

New features

- SCI: Added selection of data points based on a polygon layer.
- 'Error reading Emo File' message in EMBI/SCSEMBI now displays the specific error message.
- Geological surfaces:
 - The error bars can now be hidden of by clicking a check box in the profile window.
 - The 'update' button for uncertainty update is only enabled when something can be updated.
 - The order of the surfaces is changed according to the nodes in the workspace manager.
- Major revision of the SSV module:
 - The borehole editor:
 - On each layer added a top and bottom interval, a clay fraction and a comment field.
 - A rating is added to each borehole if auto estimate is chosen when using auto clay thickness. This is used to estimate uncertainties for the layers of the boreholes.
 - MLMax and MLMin values can now extend above and below the interval depth.
 - Three themes are added. The calculated and input fraction for borehole clay thick and the clay fraction on Geophysical clay thick.

Corrected bugs

- Fixed an index error for DCIP in the inversion visualization window.
- SSV: Fixed bug in load of saved wizard settings for parameter "UseMinDepth".
- Bug fixed for SSV when manually editing values in the borehole editor, where not all layers are given values from auto clay thickness.
- Bug fixed for SSV in registry for 'run hidden' and 'delete output files' checkboxes.

■ 20.04.2015, V.4.2.11.0 WS80

New features

- A new AarhusInv.exe is included in the release:
 - It is now possible to include more than 99.999 models in an inversion.

Corrected bugs

- Fixed an error in adding SKYTEM LCI to profiles.
- Fixed an error in exporting FEM data.
- Fixed an error that occurred when attempting to export large DBGs.
- Fixed issues with 'Export Data and Models' in DC/IP.
- Bug fixed in import ERT if negative Z values were present.
- Bug fixed for DC/IP inversions.

- Bug fixed for editing ERT in the sounding window.
- Bug fixed when running ERT inversion without saving the processing.
- Fixed errors in Tempest inversion that caused user inputs to be interpreted incorrectly.
- Fixed an error that occurred when attempting to run an SSV job on a large DBQ.
- Fixed a synchronization problem for HEM in AarhusInv.
- Fixed a problem with DBQs that prevented the user from combining nodes from different datasets. This will still not work if the datasets are in different databases.

■ **31.03.2015, V.4.2.10.0 WS79**

Corrected bugs

- Fixed an error that occurred when trying to make a new DBQuery from an inversion node.
- DBQueries should now be created with the promised number of models.
- Fixed an error that prevented creation of BHGs.

■ **03.03.2015, V.4.2.9.0 WS79**

Corrected bugs

- ERT profiles without IP no longer give access violation when edited.
- Fixed a bug in import of Tempest models.

■ **03.02.2015, V.4.2.8.0 WS79**

New features

- Support for differential GPS data for SkyTEM data.
- GCM/HEM processing: Possibility to make the average data a copy of the raw data (to be used for pre-processed data).
- 'Use Sparse Formats' under Preferences → Misc is now functional. Note that this option should be checked (which is default) in order to perform large-scale SCI inversions. Uncheck it if working with ERT.
- Normalized Chargeability is added to the list of possible profile layers that can be created.
- New right click menu item for exporting ground based TEM to new GERDA after adding survey info.
- ERT: Pole-dipole can be imported, processed and inverted.
- ERT: Negative IP data point can now be used for the inversions (The data needs to be reimported to use negative IP data points).
- ERT: The IP filter on the processing form is changed to allow negative IP data points.
- ERT: A checkbox is added for full decay curve deletion from the data profile window.
- Import of SkyTEM data is no longer restricted to 31 points in the geometry file.
- SCEMBI and EMBI had their residual plots expanded to properly view small residuals.
- Corrected bugs.
- The memory consumption of SkyTEM xyz export was brought down significantly; it should now be possible to export large amounts of data.
- The memory consumption of SCI inversions was brought down significantly. It should now be possible to invert large amounts of data.
- The memory consumed handling DBQueries was brought down significantly. It should be possible to handle large-scale DBQs now.
- Fixed a bug that caused points on the wrong geosurface profile to be deleted.

- Fixed a bug that caused freshly drawn points on a geosurface profile to be placed at wrong indexes.
- Fixed a problem that caused stack overflow when trying to invert large LCI nodes.
- Fixed a bug that would incorrectly cause the model count to be shown as -1 when creating a new DBQuery.
- Fixed a bug that prevented successful merge of two borehole databases under add/edit borehole.
- Fixed a bug that prevented the user from manually adding boreholes to a Jupiter database.
- Fixed a timing issue with SCI temporary file I/O.
- Add Topography now working properly for HEM/GCM and PACES.
- Airborne TEM (except SkyTEM): For large datasets, import would sometimes crash with error message 'Time is not increasing'.
- Bug fixed in adding survey info for ground based TEM.
- Optimization of the triangulation procedure for the model display.
- Export of profile layers that originate directly from inversions is now possible.
- ERT: Minor changes on the Inversion setup form.
- ERT: The sound distance is now locked when first inversion is run, even if the processing has not been saved.
- Bugfix in the registry of the coordinate system in 'add/edit borehole...'

Updated AarhusInv to version 6.31

- This version fixed some data specific issues for DCIP data.

■ **28.01.2015, V.4.2.7.0 WS79**

New features

- ERT Module:
 - Inv. Visualization window:
 - The DC Rel. diff plot is replaced with DC residual.
 - An IP residual plot has been added.
 - The forwarded IP data can be shown. This is synchronized with the processing window and you will be able to see the toggled off IP data.
 - There are now 4 expandable windows for plotting the models and data.
 - When showing an inversion with triangulation the DOI blinding is shown on the Model.
 - Processing form:
 - Entire IP curves can be deleted by checking the 'Enable/Disable full Decay'-checkbox either on the IP data window or on the pseudo section window when showing IP data.
 - The save function has been optimized when saving the processing when IP data is present.
 - Filter for IP data can be found on the 'Processing' tab on the processing window.
 - The property window for ERT inversions are changed to match the inversion setup window.

Corrected bugs

- Fixed bug: After inversion, IP data corresponding to the first DC data point for each model was not imported correctly to the database.
- Fixed a bug in the pixel showing inversion with triangulation.
- Show inversion Result from GCM and HEM inversions now display Channel numbers on the x-axis.
- Fixed an error that occurred when adding inverted models to a profile.
- Fixed a bug when using data from an unconnected borehole database.
- DBQ: Fixed an error in 'Add Topography..'
- SCEMBI: Fixed an issue that caused SCEMBI to crash when inverting large models.
- SCI: Fixed an error in the 'Layered model from smooth results' that prevented the user from selecting a model.
- Fixed a bug in ERT: After inversion, IP data corresponding to the first DC data point for each model was not imported correctly to the database.

- Fixed a bug in inversion setup for ERT where resistivity and depth horizontal constraints would get mixed up.

■ **26.01.2015, V.4.2.6.0 WS79**

Corrected bugs

- Fixed an error in the Borehole Report function.
- Fixed error in adding DBQs to profile.

■ **03.11.2014, V.4.2.5.0 WS79**

Corrected bugs

- Fixed a bug that caused errors to be incorrectly displayed as 'Unassigned connection in THGGQuery object'.
- Fixed a bug that prevented users from exporting PACES data.
- Fixed a bug in 'Export Data and Models' that prevented the user from selecting the correct Ident.

■ **25.09.2014, V.4.2.4.00 WS79**

New features

- While running LCI and SCI inversions it is now possible to see the progress of the iteration process, including the time of the latest iteration.
- ERT: Changing the values for all the layers is now possible on the inversion setup form (check box).
- The Profile functionality has undergone major reconstruction:
 - Restructuring of profile window and 'add to profile'- window.
 - New profiles can be created automatically from inversions and DBQs.
 - LCI and SCI inversions can be added directly to profiles without converting to DBQs.
 - IP model parameters can be added as separate nodes to the profile from both DCIP nodes and DBQs (from DCIP inversions).

Corrected bugs

- Fixed an issue that prevented users from creating new SSV processings.
- Fixed a number of smaller bugs in the PACES preprocessing program (PACES.exe).
- Fixed an error on ERT/IP import related to non-integer values of Ton and Toff in filter/waveform inifile.
- Fixed an issue with saving the standard uniform STD for DC and IP data. Default values are changed to 2% for DC and 10% for IP.
- Color and blinding properties may now be changed on existing Profile layers.

■ **25.09.2014, V.4.2.3.0 WS78**

Corrected bugs

- Fixed error in DOI line format on profiles.
- Fixed ERT 2D inversion error.
- Fixed a bug where you couldn't add user notes to nodes.
- Fixed an error that prevented creation of themes from DBQueries.
- Fixed a bug in the Batch Gridding module.

■ 24.09.2014, V.4.2.2.0 WS78

Corrected bugs

- Fixed a bug where you could not create a DBQ node from an SCI inversion.

■ 10.09.2014, V.4.2.1.0 WS78

New features

- Survey scale inversion: All inversions are now run in one chunk, and all settings referring to dividing jobs have been removed.
- New geometry file format (.ge2) supported for importing SkyTEM data.

Corrected bugs

- Under certain circumstances, omitting gates from inversion under Inversion Setup would delete the wrong gates.
- When ERT models were exported, IP data was not included.
- ERT inversion visualization: Last layer was not displayed.
- ERT: con file can now be edited from inversion setup form.
- Removed check for unused dll files causing GStat stackdump error.
- Error from importing general models fixed.
- Added check for overlapping segments when reading geometry file (SkyTEM import).
- Default min/max res in con file changed to 1e-2/1e5.
- Display error of Res2DInv inversion results fixed.
- Res2DInv: Displayed error message on second and subsequent model imports. Furthermore, the edition form has been removed.
- Boreholes can now be added to Jupiter databases downloaded from GEUS.

■ 05.09.2014, V.4.2.0.0 WS78

New features

New ERT Module:

- CVS changes name to ERT and introduces another node level as for SkyTEM.
- New GUI for configuring inversion jobs.
- New Inversion Visualization.
- Support for AarhusInv 1D DC/IP, 2D DC and 2D DC/IP inversions.
- Additions to the processing system:
 - STDs can now be calculated based on a noise model after import (Noise Model section on the Misc. tab).
 - The Inversion visualization form and the processing form are now synchronized for selection and toggling points on/off.
 - Negative and zero valued IP data points are toggled off during import.
 - When changing the profile settings all focus depths are now checked instead of unchecked.

Res2DInv:

- Support for automatic selection of 2D model inversion number.

New GCM/ HEM module:

- New processing and visualization system for GCM and HEM.

Updated AarhusInv to version 6.20

Corrected bugs

- The ERT importer now remembers latest used paths and file names.
- “View Report” on boreholes from profiles working again.
- Only one ERT processing form can be opened at a time.
- The Map is now centred around the marker, when the mouse cursor is moved along the Pseudo Section on both the Processing and the Inversion Visualization Form.
- Fixed it so that ResApriSTD and a few related vis nodes now also can be made for the last layer of the model.
- The xyz export from DBQ and SCI nodes now uses less memory. The exporter was changed to write out the data in chunks, rather than one big stream.
- Solved issue that rarely caused some cells of SCI launched from the inversion node to crash. The issue could happen when the DOI was calculated with too few points.

■ **04.09.2014, V.4.1.1.769 WS78**

Corrected bugs

- Fixed an issue with grid files in the MEP importer.
- Existing GCM and HEM workspaces are now loaded as processed data instead of raw data.

■ **21.05.2014, V.4.1.1.768 WS78**

Corrected bugs

- Fixed an issue that would delete any lines from DEM grids on profiles, if another grid was deleted from a DBQ.
- Fixed GCM and HEM issue for SCI inversions.
- Topography can now be added directly to the data nodes for GCM and HEM.
- MEP: Toggling points on with the toggle tool from the data profile form is now done point-wise instead of whole lines.
- MEP: The Curve shift factor is now properly remembered when the form is opened.
- MEP: A save-reminder is implemented.
- For SCI it is now possible to generate a layered model from a smooth model when not in debug mode.
- Profiles: Node reordering is working again.
- Fixed issue that caused an error message upon deletion of grids on DBQs.

■ **09.12.2013, V.4.1.1.767 WS78**

Corrected bugs

- Fixed issue with active bitmap in the Workspace manager when a DBQ was deleted.
- Add topography now works for GCM and HEM DBQ nodes. Work is still ongoing for adding topography for GCM and HEM data nodes.

■ **05.12.2013, V.4.1.1.766 WS78**

Corrected bugs

- Batch gridding and gridding are now working normally again.

■ 25.11.2013, V.4.1.1.765 WS78

Corrected bugs

- Fixed an uninitialized variable that could cause SCI inversions to crash during the second run.

■ 19.11.2013, V.4.1.1.764 WS78

Corrected bugs

- Fixed a database memory leak problem in SCEMBI.

■ 05.11.2013, V.4.1.1.763 WS78

Corrected bugs

- Fixed another rare text formatting issue that caused issues with the manual altitude edits.

■ 04.11.2013, V.4.1.1.762 WS78

Corrected bugs

- Fixed text formatting issue that caused issues with the manual altitude edits.
- The xyz exports for HEM data is now working again.
- The Sync Select Tool on the GIS is now working again.

■ 31.10.2013, V.4.1.1.761 WS78

First Delphi XE Workbench release

New features

- New significantly improved GUI for the ERT data processing system.

Corrected bugs

- A problem with the sounding window 'jumping' has been solved.
- Two range checks for the SSV model grid have been added:
 1. Node distance must be larger than 200 m. This prevents the user from setting up non-meaningful SSV jobs.
 2. Total number of node points (X-nodes times Y-nodes) must be < 10000. This prevents the user from setting up very big SSV jobs that will probably result in out-of-memory problems. Note: < 10000 nodes can still cause out-of-memory problems depending on the amount of memory in the current PC.
- Fixed a rare issue that prevented the edit form from opening as it could end up with a logarithmic axis with negative values.
- Fixed an issue that under certain circumstances may prevent the creation of the VIS node altdif.
- Loading an .inv file while creating a new SCI node is now working.
- Geological Surfaces: Interpolated lines are now displayed as points, thereby showing "holes" in the interpolated surface.
- Fixed an issue causing error when importing TEM40 data into an empty Gerda database.

■ 30.10.2013, V.4.1.1.760 WS77

Corrected bugs

- Updated version of GStat, resolving stability issues in the batch gridding module.
- Resolved issue with inversion of MegaTEM data.

■ 25.10.2013, V.4.1.1.759 WS76

New features

New Visualization Themes implemented:

- STD for the Conductivity Layer.
- a-priori STD for the Layers: Resistivity, Conductivity, Thickness and Depth.
- Difference between input data and inverted data.
- Max. relative data residual per data point.
- Gate no. for max. relative data residual per data point.

Corrected bugs

- Issue that caused translation function to become 99 in all its nodes was solved.
- Fixed issue causing errors when uploading an open workspace.

■ 04.09.2013, V.4.1.1.758 WS76

Corrected bugs

- Fixed issue that prevented making manual altitude corrections.
- Removed chart tools with obsolete functionality.
- Fixed issue with deletion of profile nodes.
- Changed the layout of the multi delete function.
- Batch Gridding nodes are no longer added to the GIS manager.

■ 14.08.2013, V.4.1.1.757 WS76

Corrected bugs

- Fixed issue with long database paths when creating few layered models for SCI.

■ 11.07.2013, V.4.1.1.756 WS76

New features in geo. surfaces

- New right click menu on the geo. surface list on the profile form. Functionality from former buttons has been moved to this menu.

- 'Visible Lines...' --> Points and grids from other profiles can be shown on a profile.
 - 'Line Display Settings...' -> Format of lines can be set.
 - 'Update Current/All grids' -> Updates grids with existing settings.
 - 'Update GIS Points' -> Updates the GIS points. Is shown by ticking on the geo. surface node in the 'Workspace Manager'.
 - 'Update Color' -> Updates the geo. surface color. This can also be done by clicking on the colored square.
 - 'Delete' -> Deletes the geo. surface.
- Uncertainties of already drawn points can be changed by selecting the point and selecting a new Uncertainty number, then press the button 'Update Uncertainties'.

Corrected bugs

- Fixed issue with the GIS when creating new workbench projects with certain EPSG coordinates.
- Fixed issue with deletion of files when using the "Create Final Report Page(s)" functionality.
- Fixed issue with giving new profiles names of previous deleted ones.
- Survey info database selection is now also available for MEP export.
- Font and color can now be changed in Edit Label.
- When Batch Gridding the nodes are added to the GIS manager.
- Check on Geometry file during import is now only done on enabled gates.

■ **03.07.2013, V.4.1.1.755 WS76**

Corrected bugs

- The SKY icon name has been changed to AEM.

■ **01.07.2013, V.4.1.1.754 WS75**

Corrected bugs

- Fixed issue with the start up location of the SCI wizard form.
- Now the UTM coordinates of the mouse position is written on the status bar on the profile plot. Tick the status bar visible on the top of the profile plot to use the feature.
- Fixed issue that occurred when uploading workspaces with the "Upload Workspace..." functionality.

■ **18.06.2013, V.4.1.1.753 WS74**

Corrected bugs

- Fixed an issue that prevented setting the PACES processing in-use flags from the data profile form in the inversion explorer properly.
- Changed the layout of the sounding curve plot form for PACES data.
- A check was added to ensure that all gates have a center times above zero also after being time shifted.
- The "New Combined Theme..." option has been removed from the right click menu on map layer nodes.
- Fixed issue with point themes reverting to a single colour when changing the labels.
- Re-enabled functionality to enable and disable points on DBQ and borehole maps.
- It is now possible to run a SSV job with grids also when the workspace name include spaces.

■ **13.06.2013, V.4.1.1.752 WS74**

Corrected bugs

- Fixed a synchronization error in toggling PACES data in-use flags from the inversion visualization system.
- In 'Plot Data' is added a message during click on 'constant/factor, asking for selection of item if no item is selected.
- In 'Plot Data' is the maximum value for 'buffer size in meters' under 'set buffer pos...' changed to 5000.
- The deactivate 'Plot Data' now closes the 'Plot Data'-window for Paces data as well.
- Fixed issue with units in the sounding plot form for SkyTEM data.
- Changed the layout of the sounding plot form for TEMPEST data.
- Fixed issue with how the shape of the DC explorer is saved.
- In inversion settings for TEMPEST data there are new default values for the wing settings.
- The shortcut in Model Explorer to Model Explorer Settings has been changed from Alt + a to Alt + f.

■ 07.06.2013, V.4.1.1.751 WS74

Corrected bugs

- Fixed an SCI inversion indexing error introduced in version 4.1.1.745. The issue is non-critical as any inversion affected by the problem is immediately identifiable when inspecting the result.
- Fixed a bug regarding importing VTEM data for two columns.
- A bug preventing running SSV jobs has been fixed.
- Fixed issue with the GIS info tool.
- Now there is a check for identical label names when importing XYZ files.

■ 24.05.2013, V.24.05.2013 WS74

Revision of the SSV module

- The performance has been significantly improved.
- Bigger jobs can be handled.
- Blinding the geophysical models with DOI has been implemented.
- The linking to the GEUS bore report web page has been fixed.
- SSV jobs can only be run on 64 bit windows platform, due to a new GStat version.
- The con file is now version 7.
- The model parameter analysis can be turned of in the con file. This reduces the calculation time significantly.
- Min/max value for Upper and Lower model parameter in con file has been adjusted.

New features

- In the TEM importer the column number are now shown in the alc file editor.
- Now the ALC file editor for airborne TEM data can set gate_ch01_begin and gate_ch01_end.
- If the A-priori STD is set to 0 for airborne data the altitude is kept fixed during the inversion.
- It is now possible do delete databases from the Workbench.

Corrected bugs

- Now it possible to use colorscales from all 'VIS' nodes in the 'Create Final Report Pages'.
- Now map symbols for boreholes and models are shown correctly when adding conductivity a-priori on SCI.
- Now 'New SCI' can only be called from relevant nodes.
- An issue in the Tempest importer regarding time stamps has been fixed.

- Fixed issue with altitude normalization that occurred after switching off debug mode.
- In the general model importer, the X and Y coordinates are now required.
- Now the previous selected database is remembered in the DBQ wizard.
- Fixed issue in AarhusInv with memory leak for TEMPEST data.

■ **15.05.2013, V.4.1.1.749 WS74**

Corrected bugs

- Export xyz files from an SCI node is now working properly.
- Fixed issue with AarhusInv running on Windows XP.
- When creating a new GERDA or Borehole database, the default location in the workspace folder is now always used.
- After adding a new GERDA database the importer is automatically shown.

■ **07.05.2013, V.4.1.1.748 WS74**

New features

- Now skyTEM inversions can be added to profiles. Use 'Add Data Query(DBQ) from a profile node.

Corrected bugs

- Fixed a stability issue writing PACES forward response files from AarhusInv.
- Now copying profile layers is working again.
- The unit for average sounding plots has been corrected.

■ **11.04.2013, V.4.1.1.747 WS73**

Corrected bugs

- Fixes issue causing problems when viewing profiles.

■ **10.04.2013, V.4.1.1.746 WS73**

Corrected bugs

- Fixes to em1dinv-configuration files for Tempest data.
- Smoother performance when adding topography grids to data.
- Enabled copying of the GIS map to the clipboard.
- Fixed issue with the edit display functionality.
- Due to better disk-based GIS-performance, memory catching is now disabled by default.
- Fixed coordinate problem with the DBQuery Wizard.
- Fixed issue with move up/down on profile nodes.
- A DOI related bug in the general model importer has been fixed.
- Updated version of AarhusInv supporting the Intel "Penryn" processor family.

■ **04.04.2013, V.4.1.1.745 WS73**

Corrected bugs

- The point size in the processing system are not back to normal.
- Fixed issue with error message when closing workspace.
- The properties on LCI inversion nodes now works again.
- Issue creating new processings when name of SkyTEM node was not unique.
- Issue when closing WS with several active PACES processings.
- A bug preventing running X-data inverting with pitch has been fixed.
- Fixed issue when using the edit display functionality for point themes.
- Now boreholes visible status reflects the master, from where the profile layers are copied from, i.e. if their layer is visible on the master, it is visible on the 'copied to' profile as well.
- Fixed issue about uploading of databases to the FTP.

■ **03.04.2013, V.4.1.1.744 WS73**

New features

- Beta release of Geosurface module. Official release to be announced soon.
- Corrected bugs.
- Added performance information to the log file of AarhusInv and resolved a special case problem with the approximate TEM response.

■ **14.03.2013, V.4.1.1.743 WS72**

Corrected bugs

- Fixed save issues on processed PACES data.
- All bitmaps produced with batchgridding were of a single color.
- Fixed an error that caused an exception when drawing new profiles.

■ **05.03.2013, V.4.1.1.742 WS72**

Corrected bugs

- Fixed issue in the SKYTEM processing system.
- Fixed issue related to the update of the inversion kernel.

■ **01.03.2013, V.4.1.1.741 WS72**

New features

- Updated version of the inversion kernel (AarhusInv version 6.0):
 - Memory consumption lowered significantly over previous version.
 - New approximate TEM response supporting X- component data.
 - Support for modeling of Gaussian filters found on the latest SkyTEM instrument.

- Elevation based resistivity regularization to better accommodate effects of topography.

Corrected bugs

- Fixed user reported issues with the optimized GIS component.
- Fixed a number of issues as well as optimized the PACES pre-processor.

■ **15.02.2013, V.4.1.1.740 WS72**

Corrected bugs

- Fixed issue related to profile drawing in the GIS.

■ **08.02.2013, V.4.1.1.739 WS72**

Corrected bugs

- Issues related to moving nodes up/down in the workspace tree.

New feature

- Improvements to the GIS-performance. The redrawing of maps is now faster.
- The 'auto scale' option for inversions now provides much better starting models for LCI and SCI.

■ **31.01.2013, V.4.1.1.738 WS72**

Corrected bugs

- Fixed a database related bug in SSV 'auto clay'.
- Fixed issue with bad data type in batch gridding process.

■ **21.01.2013, V.4.1.1.737 WS72**

Corrected bugs

- Fixed issue with too big STD values on raw SKYTEM data.

■ **02.01.2013, V.4.1.1.736 WS72**

Corrected bugs

- Fixed critical pathing issue that occurred spontaneously when activating SkyTEM processings.

■ **17.12.2012, V.4.1.1.735 WS72**

Corrected bugs

- Implemented load/save of dates of .GDT files in the PACES pre-processing program.
- In the SSV auto clay calculation a change has been made when calculating between two grids. If the value from the grid at the borehole position is above the elevation/topography from the borehole database the borehole/interval is set 'not in use', and an autocomment is added. This makes the SSV job run.

- Fixed issue during import of data with multiple channels (TEMPEST, SKYTEM XYZ).
- Fixed issue with inversion of old PACES data downloaded from GERDA.

■ **12.12.2012, V.4.1.1.734 WS72**

Corrected bugs

- Fixed bug during a processing node action.
- Fixed issue with the GCM importer in the ppm format.

■ **11.12.2012, V.4.1.1.733 WS72**

Corrected bugs

- Fixed issue with the SCI.

■ **21.11.2012, V.4.1.1.732 WS72**

Corrected bugs

- Fixed issue with the fence gridding in GIS.
- Fixed bad check for dummy values and thicknesses in the general model importer.
- Fixed issue with section-selection in inversion explorer.
- Fixed a number of issues in the CVS-processing module.
- Removed limit of 8 characters on VIS node names.
- Fixed bug on the update of the color scale in the color scale wizard.
- Fixed random bug making the export of an SCI node, correctly inverted, impossible.
- In SkyProcessing when plotting GPS data, GPS Altitude has been changed to GPS Elevation (WGS84) and GPS Elevation has been changed to GPS Altitude.

New feature

- Keyboard shortcut for toggling map-centering on/off in SkyTEM processing (Ctrl + C).
- It is now possible to change the order of the nodes in the Workspace Manager tree.
- Use the right click menu or the short cuts Ctrl + and Ctrl –.
- It is now possible to know the database name of a node by passing the mouse over this node.
- The copy to clipboard functionality has been enabled again.
- Support for different numbers of layers in the general model importer (models from xyz-files).
- To allow for colorscales to handle very small units, a 'scaling factor' has been added to the preferences form. If used, values will be multiplied by this factor before a colorscale is applied.
- GIS now supports SID raster layers.
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- 16.11.2012 4.1.1.731
- WS71 Corrected bugs
- Fixed issue causing monochrome display of VIS-nodes when 'In-memory'-caching was enabled for the GIS
- Log option is now available for Histogram works out in the Colorscale wizard
- Fixed bug with Res2DInvViewer and the wrong library files