A COMPREHENSIVE VALIDATION OF THE SKYTEM SYSTEM

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Accuracy and stability of data from airborne electromagnetic systems is an issue addressed in numerous publications and conference presentations. We have recently done a comprehensive and well documented comparison of data from ground based measurements and repeated SkyTEM lines from different altitudes.

The ground based test line was made on the National Danish Test Site and consists in two perpendicular lines each of a length of 1.0 km. On each of these lines 25 soundings with a 40x40 m^2 TEM system was made. The TEM system measures the first time gate in 8 micro sec from begin of ramp and was prior to the measurements calibrated at the test site.

Comparing inversion results form the SkyTEM and the groundbased data shows that the model repeatability of the SkyTEM system is excellent in both the same altitude and in different altitudes. Also, there are no directional problems, i.e. it does not matter in which direction the lines are flown. The agreement to the groundbased reference sections is also very good, showing that the SkyTEM-system yields data of same high quality as the groundbased system.

A validation of the SkyTEM system at the data level was set up to examine the responses gate by gate, which, among other things, rules out the equivalent model issue. The different comparisons in the data space show that the SkyTEM system repeats the test lines equally good in different altitudes, and the agreement to the ground based responses is very good and in general within the data standard deviation of 5%.

The validation serves as a quality assurance of the high-precision modeling of the SkyTEM system, together with the robust processing and inversion scheme developed for the data. The validation of the SkyTEM system now set the standard for the data quality.
expected for any airborne system to qualify for the Danish national groundwater mapping effort.