

# An efficient hybrid inversion scheme combining approximate and full forward solutions for AEM

C. Kirkegaard<sup>1</sup>, C. Schamper<sup>1</sup>, A.V. Christiansen<sup>1</sup>, G. Vignoli<sup>1</sup>, E. Auken<sup>1</sup>

1. HydroGeophysicsGroup, Department of Geoscience, Aarhus University, Denmark

## ABSTRACT

Airborne time domain electromagnetic instruments provide a widely used surveying tool for a range of applications with very varying requirements towards accuracy. The method allows for collecting extremely large datasets in relatively little time, but to be able to extract quantitative information the data typically has to undergo some kind of modelling. In mineral exploration it is often possible to identify targets directly from the data, whereas high-accuracy modelling is typically crucial in the case of eg. hydro-geophysical surveys. In order to support the requirements of these very different fields a whole range of modelling schemes exists, ranging from very fast approximate techniques to more accurate and much more time consuming full system models. We discuss how an approximate- and a full system forward model can be combined into a versatile hybrid inversion scheme that makes no compromise in the numerical formulation of the physical system. We use this hybrid scheme to examine different degrees of approximation and demonstrate the impact on accuracy and performance.

**Key words:** Inversion, TEM, approximation., large datasets