2. The transmitter loop can be approximated as multiple dipole moments. This assumption greatly simplifies our calculations, as the functions contained in the model are separable. The model is used to recover the position, orientation and size of the target. In this example, we simultaneously estimate the background signal and model the geologic response of a compact metallic target and a host that has both viscous remanent magnetic as well as conductive properties. Simple geological scenarios were also modelled to study the effects of a thin magnetic soil layer on the performance of the inversion algorithm.

Example 2: Modelling EMI Array Data

Due to the presence of magnetic soils we expect that changes in ground clearance (due to wheels moving over the target) will affect the results. It is therefore important to model the geologic response of a compact metallic target and a host that has both viscous remanent magnetic as well as conductive properties. Simple geological scenarios were also modelled to study the effects of a thin magnetic soil layer on the performance of the inversion algorithm.

Example 2. Inversion of Geonics EM37 TEM data at Camp Sibert

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Investigating the Effect of Geomagnetic on EMI Data through Numerical Modeling of Maxwell's Equations

EH3D is a flexible forward modeling program developed at UBC-CTP that allows users to model the EM fields resulting from a wide range of time-domain electromagnetic sources and natural sources (e.g., lightning and earth tides) over a large area. It is based on the finite difference time domain (FDTD) method and is able to accurately model the response of a compact metallic target and a host that has both viscous remanent magnetic as well as conductive properties.

Example 1. Inversion of Geophex GEM3 FEM data at Camp Sibert

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Example 1: Modelling multi-component, multi-sensor data

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Example 2. Inversion of Geonics EM63 TEM data at Camp Sibert

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