

## Abstract Details

**Session title:** A19 - Posters - Space Weather & Ground Observations: Geomagnetic Induced Currents and Corresponding Regional Conductivity Models of the Earth's Lithosphere

**Session type:** Poster Session

**Symposium:** A19

**Presentation number:** A19p-260

### ★ Abstract title:

Coupled Global Magnetosphere and 3-D Electromagnetic Induction Modelling of Magnetic Field Perturbations During Substorm Event: Results and Comparison to Observations

E. Ivannikova<sup>1,2</sup>, V. Merkin<sup>3</sup>, M. Kruglyakov<sup>1,4</sup>, [A. Kuvshinov](#)<sup>1</sup>.

<sup>1</sup>ETH Zurich, Institute of Geophysics, Zurich, Switzerland.

<sup>2</sup>Institute of Physics of the Earth, Near-Earth Space Physics Laboratory, Moscow, Russian Federation.

<sup>3</sup>Johns Hopkins University, Applied Physics Laboratory, Laurel, USA.

<sup>4</sup>Institute of Physics of the Earth, Geoelectromagnetic Research Centre, Moscow, Russian Federation.

We present results of numerical modelling of ground magnetic field perturbations due to an isolated magnetospheric substorm. Electromagnetic (EM) induction modelling is performed on a global scale (for the whole Earth) and exploits a 3-D conductivity model of the Earth. The conductivity model is excited by external magnetic field perturbations generated by ionospheric, field-aligned and magnetospheric current systems in a global magnetohydrodynamic (MHD) simulation of the substorm event. The Lyon-Fedder-Mobarry MHD model driven by observed upstream solar wind conditions was used. By utilising the combination of EM and global MHD models we derive both external and induced components of ground magnetic field. We further discuss the comparison of simulated and observed ground magnetic field perturbations during the substorm at multiple high-latitude observatories distributed across a range of magnetic local times around midnight and, thus, reflecting the dynamics of the nightside magnetosphere.