



Co-estimation of satellite fluxgate calibration parameters with internal geomagnetic field coefficients

Patrick Alken (1), Nils Olsen (2), Chris Finlay (2), and Arnaud Chulliat (1)

(1) Cooperative Institute for Research in Environmental Sciences, University of Colorado, Boulder, CO, USA, (2) DTU Space, Copenhagen, Denmark

Dedicated geomagnetic satellite missions such as CHAMP and Swarm carry scalar magnetometers which provide an absolute reference to calibrate their vector fluxgate instruments. Satellite missions such as DMSP and Cryosat carry vector fluxgate instruments but no scalar reference magnetometer. While these datasets are of lower quality than dedicated missions, they are valuable in providing geomagnetic field data during the gap period between CHAMP and Swarm. Past work done in calibrating these missions has used an a priori geomagnetic field model to calibrate the fluxgate instrument, however this could potentially impose biases and errors into the calibrated data coming from the chosen model. We will present a new approach in which the fluxgate calibration parameters are determined by co-estimating them with the internal geomagnetic field coefficients, eliminating the need to use an a priori field model. We will also present initial results of observed secular acceleration signals originating in Earth's core during the gap period as seen from this new approach.