Real-time monitoring of geomagnetic activity is often complicated by the fact that global coverage and measurements from many stations are required. In consequence local magnetic observations from a single station are often used as a substitute. Magnetic observations from polar orbiting LEO satellites are, however, more global in nature and could be used as a useful alternative for space weather applications.

In this study a decade of observations of magnetic field intensity from the Ørsted, CHAMP and SACC magnetometers are used to infer the position of the auroral electrojet and to estimate global geomagnetic activity as expressed by geomagnetic indices such as Kp and Dst. The estimated latitude of the auroral electrojet is compared to the automated auroral boundaries derived from DMSP, and a close correspondence is found between electrojet position and the position of the maximum in the average energy of the precipitating electrons. In addition measures of the auroral electrojet intensity are derived, that for the northern hemisphere is highly correlated with the AU and AL groundbased magnetic indices. The study is part of the Solar-Terrestrial Investigations and Archives (SOTERIA) collaboration.