



Solar wind coupling to local ground magnetic field fluctuations

P. Wintoft, M. Wik, and H. Lundstedt

Swedish Institute of Space Physics, Lund Division, SE-22370 Sweden (peter@lund.irf.se)

An empirical non-linear model has been developed that couples the upstream solar wind plasma and magnetic field to the local magnetic field fluctuations measured at Brorfelde (11.67°E, 55.63°N) and Uppsala (17.35°E, 59.90°N). The main goal is to study the high time resolution (minutes) difference of the north-south (ΔX) and east-west (ΔY) magnetic field because of the relation to the geoelectric field and related effects like geomagnetic induced currents. From wavelet analysis it is found that most of the power is located at periods of 30 minutes or less. To capture most of the variance and simultaneously make a solar wind coupling study feasible we form 10-minute RMS of ΔX and ΔY . The importance of the different solar wind parameters is discussed. A few selected events are also shown and discussed. The model has been implemented for real-time operation and can be found at <http://solarwind.lund.irf.se/forecast/>. The work has been carried in an ESA/ESTEC Pilot Project and information about the project can be found at <http://www.lund.irf.se/gicpilot/>.