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High-latitude geomagnetic disturbances during ascending solar cycle 24

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High-latitude regions are very convenient for study of several space weather phenomena such as substorms. Large geographic coverage as well as long time series of data are essential due to the global nature of space weather and the long duration of solar cycles. We will examine geomagnetic activity in Greenland from magnetic field measurements taken by DTU (Technical University of Denmark) magnetometers during the years 2010 to 2014. The study uses data from 13 magnetometer stations located on the east coast of Greenland and one located on the west coast. The original measurements are in one second resolution, thus the amount of data is quite large. Magnetic field H component (positive direction towards the magnetic north) was used throughout the study. Data processing will be described from calibration of original measurements to plotting of long time series. Calibration consists of determining the quiet hour of a given day and reducing the average of that hour from all the time steps of the day. This normalizes the measurements and allows for better comparison between different time steps. In addition to the full time line of measurements, daily, monthly and yearly averages will be provided for all stations. Differential calculations on the change of the H component will also be made available for the duration of the full data set. Envelope curve plots will be presented for duration of the time line. Geomagnetic conditions during winter and summer will be compared to examine seasonal variation. Finally the measured activity will be compared to NOAA (National Oceanic and Atmospheric Administration) issued geomagnetic space weather alerts from 2010 to 2014. Calculations and plotting of measurement data were done with MATLAB. M_map toolbox was used for plotting of maps featured in the study (http://www2.ocgy.ubc.ca/∼rich/map.html). The study was conducted as a part of the ReSoLVE (Research on Solar Long-term Variability and Effects) Center of Excellence.