README

30 JAN 2022

Google Drive for cooperative research into CrowdMag observatory data from Prudhoe Bay Alaska.

The \*.csv files are the contributed CrowdMag data files from our friends at the Prudhoe Bay geomagnetic observatory.

The \*.xlsx files are “quick and dirty” Excel files that I made based on several of the contributed data files. I picked these particular files because they span periods where there was some interesting geomagnetic variation present on the observatory records for the same time period. For most of the files I simply calculated a totalfield value from the xyz components, plotted the values, and the circled the areas where there were interesting geomag variations in the observatory data.

For one of the \*.xlsx files (2021-12-07) I plotted a polynomial trend line (a reasonable proxy for thermal variations in the data caused by ambient temperature fluctuations where the phone was sitting) and a rolling average (to smooth out phone sensor noise). The departure of the rolling average curve from the thermal polynomial is a simple filter that might isolate true geomag variation, especially if you catch a big event.

The site <https://www.usgs.gov/programs/geomagnetism/data> has some good tools for viewing and grabbing geomag observatory data. Data from the Barrow and Deadhorse are of interest for comparison with our Prudhoe volunteer data. You can view and download data from these tools. I have not had good luck grabbing the Deadhorse values, but I think Manoj has figured it out - I will ask him to jump in and update us on this.

The file crowdmag\_SAMSUNG-SM-G935A\_ANALYSIStimefix.xlsx is a (really messy, sorry!) file showing our summer 2021 experiments with data from another CrowdMag friend in Fairbanks. The “Subset analysis (2)” shows a plot (copied below) comparing smoothed CrowdMag data (gray line) and smoothed Fairbanks Observatory data (blue line) for a geomagnetic excursion on June 30, 202 (see plot below). Our 2021 summer intern, Jae Robinson, used this example in her talk and poster to indicate that it is possible to find space weather events in CrowdMag data if you look hard enough.

