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CROWDMAG: NON-TRADITIONAL OBSERVATION OF EARTH'S MAGNETIC FIELD

Abstract

In partnership with the Cooperative Institute for Research in Environmental Sciences (CIRES), NCEI started a crowdsourcing project (CrowdMag) to collect vector magnetic data from digital magnetometers in smartphones. The aim is to distill meaningful magnetic data from a large number of noisy measurements and use these data to fill gaps in the global geomagnetic data coverage. Data from a typical phone gives the three components of the local magnetic field with a sensitivity of about 150 to 600 nanotesla (nT), although newer phones are becoming more accurate. Smartphones combine magnetic data and accelerometer data to determine the phone's orientation is determined. Crowdmag uses the phone's internet connection to send magnetic data and location to NCEI. We check the quality of the magnetic data from all users and make the data available to the public as aggregate maps. Currently, the CrowdMag project has about 28,000 enthusiastic users who have contributed more than 31 million magnetic data points from around the world. On another research front, we have worked with talented engineering students from the University of Colorado to develop a prototype low-cost external magnetic sensor that interfaces with CrowdMag and is sensitive enough for detecting magnetic signals originating from space-weather and geological structures. Also, we are currently beta-testing CrowdMag flight-mode for collecting magnetic data while flying in commercial airlines. Our talk will cover the latest scientific results from CrowdMag project and the lessons learned. Finally, we will present the CrowdMag data collected during the 68th International Astronautical Congress held at Adelaide during 25-29 September 2017. A total of 1986 vector magnetic data were collected by 11 devices by the participating delegates along a predetermined path in Adelaide.

For more information on CrowdMag project, visit https://www.ngdc.noaa.gov/geomag/crowdmag.shtml.