

Integrated study of St. Patrick's Day 2015 Event by using IUGONET analysis software

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"The IUGONET" (Inter-university Upper atmosphere Global Observation NETwork) project was established in 2009 as a research project supported from the Ministry of Education, Culture, Sports, Science and Technology (MEXT), Japan, to unite databases which maintained by each institute and to accelerate to make data-sharing network in our community. It was launched by five Japanese universities and institutes (NIPR, Tohoku University, Nagoya University, Kyoto University, and Kyushu University), and built much collaboration with both domestic and international institutes/projects. One of the IUGONET's product is analysis software which can use for scientific research and publication, called the iUgonet Data Analysis Software (UDAS). It is a plug-in software of Space Physics Environment Data Analysis System (SPEDAS), which is upgraded from Themis Data Analysis Software (TDAS). The UDAS provides many routines for loading the ground-based observational data from various types of instruments, for example radars, magnetometers, photometers, radio telescopes, helioscopes, and so on, and performing scientific data analysis.

During 15-18 March 2015, we encountered a strong geomagnetic storm event called "St. Patrick's Day 2015 Event". A long duration C class solar flare and related CMEs were occurred on 15 March. In the result, a severe geomagnetic storm (minimum Dst index was -228 nT) were observed during 16-18 March. It is the first and largest event reported over -200nT Dst index in current solar cycle 24. However, no large solar energetic particle and related events were observed, and therefore, we could not forecast such a huge geomagnetic storm attacked to the Earth. For investigating the mechanism of this complex space weather event between Sun and Earth region, it is important to make cross-cutting studies with various kinds of data observed at various regions and methods. Thus, UDAS is a good choice for any space weather researchers, because it can make it easy to combine a various kind of data in a unified way. In this presentation, we will introduce the IUGONET product and some results of the huge geomagnetic storm event.