Japan Geoscience Union Meeting 2012
(May 20-25 2012 at Makuhari, Chiba, Japan)
©2012. Japan Geoscience Union. All Rights Reserved.

PEM07-07 Room:304 Time:May 22 11:00-11:25

Empirical Space Weather Forecast Models Based on Solar Data

MOON, Yong-Jae[1*]

[1]School of Space Research, Kyung Hee University

We are developing empirical space weather (solar flare, solar proton event, and geomagnetic storm) forecast models based on solar data. In this talk we will review their main results and recent progress. First, we have examined solar flare (R) occurrence probability depending on sunspot McIntosh classification, its area, and its area change. We find that sunspot area and its increase (a proxy of flux emergence) greatly enhance solar flare occurrence rates for several sunspot classes. Second, a solar proton event (S) forecast method depending on flare parameters (flare strength, duration, and longitude) as well as CME parameters (speed and angular width) has been developed. We find that solar proton event probability strongly depends on these parameters and CME speed is well correlated with solar proton flux for disk events. Third, we have developed an empirical storm (G) forecast model with its probability and strength based on halo CME ? Dst storm data. For this we use storm probability maps depending on CME parameters such as speed, location, and earthward direction. We are also looking for geoeffective CME parameters such as cone model parameters and magnetic field orientation. We find that all superstorms (less than -200 nT) occurred in the western hemisphere with southward field orientations. Finally, we summarize several ongoing works for space weather applications.

Keywords: space weather, flare, solar proton event, geomagnetic storm