[포SE-34] Empirical Forecast of Solar Proton Events based on Flare and CME Parameters

Jinhye Park and Yong-Jae Moon
School of Space Research, Kyung Hee University

In this study we have examined the probability of solar proton events (SPEs) and their peak fluxes depending on flare (flux, longitude and impulsive time) and CME parameters (linear speed, longitude, and angular width). For this we used the NOAA SPE list and their associated flare data from 1976 to 2006 and CME data from 1997 to 2006. We find that about 3.5% (1.9% for M-class and 21.3% for X-class) of the flares are associated with SPEs. It is also found that this fraction strongly depends on longitude; for example, the fraction for 30W° < L < 90W° is about three times larger than that for 30°E < L < 90°E. The SPE probability with long duration (≥ 0.3 hours) is about 2 (X-class flare) to 7 (M-class flare) times larger than that for flares with short duration (< 0.3 hours). In case of halo CMEs with V ≥ 1500km/s, 36.1% are associated with SPEs but in case of partial halo CME (120° ≤ AW < 360°) with 400 km/s ≤ V < 1000 km/s, only 0.9% are associated with SPEs. The relationships between X-ray flare peak flux and SPE peak flux are strongly dependent on longitude and impulsive time. The relationships between CME speed and SPE peak flux depend on longitude as well as direction parameter. From this study, we suggest a new SPE forecast method with three-steps: (1) SPE occurrence probability prediction according to the probability tables depending on flare and CME parameters, (2) SPE flux prediction from the relationship between SPE flux and flare (or CME) parameters, and (3) SPE peak time.

[포SE-35] FISS Observation of Bright Rims of Solar Filaments

Heesu Yang[1], Jongchul Chae[1], Hyungmin Park[1], Donguk Song[1]
[1] *Department of Physics and Astronomy, Seoul National University.*

Rims of solar filaments often appear brighter than the background chromosphere, but their physical nature is still poorly known. Last year, we observed a filament with a bright rim. The rim was bright in H alpha but not in Ca II 8542 line. Using the cloud model, we inferred physical parameters of the region from the spectral profiles. As a result, we found that the Doppler width of the H alpha line is very large, which implies temperature as high as 50000K. In addition, the value of the source function of the H alpha line is 0.7 times the continuum intensity of background profile. These results suggest that the bright rims might be a region of intense heating, probably associated with a current sheet. To further investigate this possibility, we carried out more observations this summer. We will present new results obtained from the analysis of these observations and discuss the physical implication of these measurements on the nature of bright rims and the filaments.