

A quantitative study on solar magnetic field and activities

Guo J.; Zhang H.

National Astronomical Observatories, Chinese Academy of Science, Beijing, 100012, China,
(gj@sun10.bao.ac.cn)

As compared with Mount Wilson Magnetic Classification (MWMC), effective distance (E_d) is a useful parameter, which gives a quantity for magnetic configuration of active regions. We have studied the evolutions of magnetic field of five active regions using E_d , total flux (F_t) and tilt angle (Tilt) quantitatively. Furthermore, 43 flare-associated and 25 CME-associated active regions have been studied to investigate and quantify the statistic correlation between flare-CMEs and the three parameters. The main results are as follows: (1) There is a basic agreement between E_d and MWMC. Moreover, E_d provides a quantity for magnetic classification. (2) The evolution of magnetic field can be described in three aspects quantitatively and accurately by the three parameters, especially E_d on analysis of delta active regions. (3) The high correlation between E_d and flare-CMEs means that E_d could be a promising measure to predict the flare-CME activity of active regions.