

Correlation between speed of CMEs and parameters of longitudinal magnetic field of CME-related active regions

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Fast CMEs drive hazardous space weather in the form of intense solar energetic particle events and severe geomagnetic storms. To develop a method to predict CMEs is important both for the practical benefit of improved forecasting of damaging space weather and the theoretical benefit of testing and improving our physical understanding of these and similar magnetic explosions on the Sun. Recently our studies have revealed that Effective distance (Ed), a structural parameter proposed by Chumak et al. (1987), was a very important synchronous parameter, which can be easily measured from longitudinal magnetic field and can quantify the magnetic complexity of active regions. Moreover, Ed makes it possible to investigate the quantitative relationship between magnetic structures and other solar indices (flares and CMEs originated in active regions). Here we will firstly introduce the meaning and usefulness of Ed and demonstrate some analyses of active regions by Ed together with other two parameters. We will present a statistical study with the emphasis on the correlation between speed of 83 CMEs and five parameters of longitudinal magnetic field of CME-related active regions.