

Relation between the CME Velocity and the Magnetic Field

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The velocities of Coronal mass ejections (CMEs) range from tens to more than 2000 km/s. Earlier researches tended to fit them into a bimodal distribution, with the fast ones corresponding to flares, and the slow ones to filament eruptions. However, recent observations do not favor such a classification, and tend to imply that magnetic reconnection plays an important role in the eruption of CMEs. According to the reconnection model, the velocity of the ejecta is proportional to the magnetic field strength in the inflow region. We present a statistical analysis of CME speeds with relation to the magnetic parameters. It is found that the CME velocity correlation with the average magnetic field is significantly higher than with the total magnetic flux in the source region. It is also seen that filaments with the minority chirality tend to erupt as slow CMEs.