
The geoeffectiveness of ICMEs

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Abstract

It is well established that the origin of geomagnetic storms are related to interplanetary structures possessing southward interplanetary magnetic field component (Gonzalez et al., 1994). Coronal mass ejection counterparts observed in the interplanetary medium, called ICMEs, are found to be some of the most frequent sources of such southward fields. ICME internal fields and sheath fields associated with their interplanetary shocks are both the dominant origins of intense geomagnetic storms ($Dst < 100nT$) in the ascending phase and maximum of the solar cycle. In the descending phase, corotating interaction regions (CIRs) become also important. Among the ICMEs it is possible to highlight the magnetic clouds (Burlaga et al., 1981) as strong sources of southward fields. Not very frequent, but also important are the interaction of ICMEs and high speed streams because they can cause $Dst < 200nT$ magnetic storms. We present a review of the geoeffectiveness of interplanetary coronal mass ejections (ICMEs), with emphasis on solar cycle 23.

Keywords: ICMEs, magnetic clouds, interplanetary shocks, geomagnetic storms

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