Study of Intense Geomagnetic Storms and Their Solar / Interplanetary Causes

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Shocks driven by energetic coronal mass ejections and other interplanetary transients are manly responsible for large disturbances in geomagnetic field of earth and play a key role in producing a geomagnetic storm or substorms. A geomagnetic storm is a global disturbance in Earth's magnetic field usually occurred due to abnormal conditions in the interplanetary magnetic field (IMF) and solar wind plasma emissions caused by various solar phenomenon. Identifying intense geomagnetic storms with Dst decrease more than / or equal to 300 nT occurred during so1ar cycle 23, a correlative study has been performed to analyze the associated solar and interplanetary causes of these events using solar wind plasma, interplanetary magnetic field (IMF) and solar geophysical data. It is observed statistically that 55% storms have occurred during solar maximum and 45% occurred during minimum phase of solar cycles. Further, study reveals that 97% intense storms are associated with coronal mass ejections (CME's), which confirms earlier findings.