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CME-driven Interplanetary Shocks and associated Sudden Commencement signatures observed at low latitudes

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Interplanetary (IP) shocks driven by coronal mass ejections (CMEs) are indicative of powerful eruptions on the sun that accelerate to very high energies. Recently, it is reported that the radio-emission characteristics of 222 interplanetary (IP) shocks detected by spacecraft at Sun-Earth L1 during solar cycle 23 (1996 to 2006, inclusive) (Gopalswamy et al., 2009). A surprisingly large fraction of the IP shocks (˜34%) was radio quiet (i.e., the shocks lacked type II radio bursts) compared to radio-loud (RL) shocks. These CME driven shocks arriving at Earth also compress the magnetosphere causing storm sudden commencement (SSC), which may be followed by a geomagnetic storm if the shock sheath and /or the driving IP CME (ICME) contains south-pointing magnetic field. We examined the properties of SSCs amplitude which observed at low latitude stations Alibag (ABG, 10. 17 N Geo.mag.Lat.) related to the IP./ICME/ CME shock speeds. We further analysed the categories of RL and RQ shocks and associated characteristics of SSCs. It is interesting to observe that the RL shocks have produced high amplitude SCs than RQ shocks and also investigated associated phenomena such as Ejecta and Magnetic cloud type and related shocks. The important results will be will be presented and discussed.

References
N. Gopalswamy et al., American Astronomical Society, 2009.

Keywords: Interplanetary shocks, sudden commencements, magnetic storms