Shocks and their Geomagnetic Effects

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Sheath regions behind fast forward shocks are second only to magnetic ejecta in driving intense geomagnetic storms at Earth. Fast-foward shocks also routinely compress Earth's dayside magnetosphere, sometimes resulting in loss of energetic particles in the outer radiation belt through magnetopause shadowing and large geo-electric fields associated with sudden impulse. Here, we discuss the importance of the upstream medium into which shocks propagate, and, in particular the propagation of shocks inside previous ejecta, in determining their geo-effective potential. We also analyze which types of shocks result in strong geo-electric fields.

Keywords: Coronal Mass Ejections, Shocks, Geomagnetic response

