Space Plasmas in the Solar System, including Planetary Magnetospheres (D)
Plasma Transport across Magnetospheric Boundaries (D3.5)

PARTICLE HEATING RESULTING FROM CORONAL MASS EJECTION

Suman Paul, paul_suman30@yahoo.co.in
Centre of Advanced Study in Radio Physics and Electronics, University of Calcutta, Kolkata, India
Syam Sundar De, de_syam_sundar@yahoo.co.in
University of Calcutta, Kolkata, India
Gautam Guha, goutamguha@gmail.com
University of Calcutta, Kolkata, India

Coronal Mass Ejection (CME) is a continuous phenomena occurring from the entire solar coronal zone responsible for the outflow of solar masses, viz., protons, electrons, neutrons and solar wind in the form of plasma. These perturb the Earth's atmosphere via magnetopause. Very high temperature plasma generator in the solar atmosphere produces huge magnetic dipoles with intense magnetic field. It traps the energetic charged particles released from the solar corona. These particles gyrate along the magnetic field lines and are gradually elongated outwards from the Sun. Due to this, the field lines get detached at some critical limit thereby enhancing the magnetic reconnection with the interplanetary magnetic field releasing huge energy in the form of X-rays and γ-rays. This perturbs the Earth's atmosphere.

In this work, the situation has been investigated by momentum balance equation, energy balance equation along with the equations of continuity and states. From the analyses, the dispersive nature of the thermospheric medium is studied. Variation of normalized electron temperature with dimensionless time has been critically contemplated. The altitude dependent electric field in the medium is also investigated.