

Evidence for the effect of CMEs on the non-radial solar wind flows and IMF B_z component observed near earth.

B. FELIX PEREIRA¹ and T. E. GIRISH²

¹*Department of Physics, St. Xavier's College, Thumba, Trivandrum 695586, INDIA.*

²*Department of Physics, University College, Trivandrum 695034, INDIA.*

One of the main solar causes that can affect the orientation of IMF is CMEs. The orientation of IMF in the meridional direction is found to be large for high speed wind compared to low speed wind during solar maximum period (Felix and Girish, 2004) in which period, occurrence of CMEs is large. The present work establishes a relationship between non-radial solar wind flows and the north-south component of IMF in the GSE system. We have also studied the asymmetry in the widths of CME distribution in the northern and southern hemispheres and its association with the non-radial flows of the solar wind.

Hourly values of IMF and solar wind plasma data by earth-orbiting satellites for the period 1967-2003 published by NSSDC have been used to study the variations of north-south component of IMF and solar wind flow latitude. Published CME data from SMM and SOHO have been used to study the CME latitudinal distribution in the northern and southern hemispheres of the sun. Significant correlation (0.51) is obtained between solar wind speed latitude (V lat.) and B_z/B during the period of study. Two period, 1984 during cycle 22 and 2001-2002 during cycle 23, have been selected to study the influence of CMEs on solar wind because during 1984, V lat. has a positive value and during 2001-2002, V lat. has a negative value. The widths of the distribution of CMEs in the northern and southern hemispheres have been calculated separately for these periods (Table 1). A north-south asymmetry is observed for the CME distribution, which favours north (positive) during 1984 and south (negative) during 2001-2002 period (Gopalswamy et al. 2003).

Table 1. First five normalized natural frequencies of a clamped beam with internal hinge at 4 different locations.

Year	North	South
1984	17.34	15.54
2001	21.82	23.97
2002	21.98	23.51

References

- [1] B. Felix Pereira and T. E. Girish, *Geophys. Res. Lett.* **31**, L09801 (2004).
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