

Variability of Geomagnetic Field with Interplanetary Magnetic Field at Low, Mid and High Latitudes

S. Bhardwaj¹, P. A. Khan², R. Atulkar¹, P. K. Purohit^{1*}

¹National Institute of Technical Teacher's Training and Research, Bhopal- 462002 M.P., India

²Department of Physics, Islamic University of Science and Technology, Pulwama-192122, J & K, India

Received 11 September 2017, accepted in final revised form 30 January 2018

Abstract

The fluctuations in the Interplanetary Magnetic Field significantly affect the state of geomagnetic field particularly during the Coronal Mass Ejection (CME) events. In the present investigation we have studied the influence of Interplanetary Magnetic Field changes on the geomagnetic field components at high, low and mid latitudes. To carry out this investigation we have selected three stations viz. Alibag (18.6°N, 72.7°E), Beijing MT (40.3°N, 116.2°E) and Casey (66.2°S, 110.5°E) one each in the low, mid and high latitude regions. Then we selected geomagnetic storm events of three types namely weak ($-50 \leq \text{Dst} \leq -20$), moderate ($100 \leq \text{Dst} \leq -50$) and intense ($\text{Dst} \leq -100\text{nT}$). In each storm category 10 events were considered. From our study we conclude that geomagnetic field components are significantly affected by the changes in the IMF at all the three latitudinal regions during all the storm events. At the same time we also found that the magnitude of change in geomagnetic field components is highest at the high latitudes during all types of storm events while at low and mid latitude stations the magnitude of effect is approximately the same.

Keywords: IMF; CME; Geomagnetic storm; Geomagnetic field.

© 2018 JSR Publications. ISSN: 2070-0237 (Print); 2070-0245 (Online). All rights reserved.
doi: <http://dx.doi.org/10.3329/jsr.v10i2.34509> J. Sci. Res. **10** (2), 133-144 (2018)

1. Introduction

The most important characteristic feature of the earth that distinguishes it from other planets of the solar system is that it is the only planet that supports life. The life supporting system is made possible by a protective shield of gases (atmosphere) and a cover of magnetic field around it. The protective cover of magnetic field around earth is confined in a specified region around it, known as magnetosphere. The magnetic field of

* Corresponding author: Purohit_pk2004@yahoo.com