

## On the ionospheric response to CIR and CME driven geomagnetic storms of June 2015

Shreedevi P. R.\*(1), Manu Varghese (2), Sean Elvidge (1), R. K. Choudhary(3)

(1) Space Environment and Radio Engineering, University of Birmingham, Birmingham UK
(2) Institute of Space Sciences, Shandong University, Wehai, China
(3) Space Physics Laboratory, Vikram Sarabhai Space Center, ISRO, Trivandrum, India

The Earth's ionosphere is greatly affected by the exchange of energy and momentum via the wind-magnetosphere interaction during geomagnetic storms. However, solar our understanding of the ionospheric response to coronal Mass Ejection (CME) and Corotating Interaction Region (CIR) driven storms are still far from complete. In this paper, the latitudinal evolution of ionospheric storms and its relation to the solar wind forcing has been investigated by studying the ionospheric response to two geomagnetic disturbances that occurred in June 2015 driven by a CME and CIR respectively. GPS total electron content (TEC) measurements from the Indian Network for Space Weather Impact Monitoring (INSWIM) network of stations are used in this study. During the CME driven storm that commenced on 21 June 2015, a positive ionospheric storm was observed at the low-mid latitude stations during the early main phase of the storm followed by a negative ionospheric storm during the late main to recovery phase of the storm. Significant enhancements in the TEC were observed at the mid and low latitude stations lying across the Indian longitude during the CIR driven storm of 8 June 2015 also, but for a prolonged duration. The role of storm time electric fields and neutral winds in causing the ionospheric storm effects at the mid-low latitude ionosphere during both the storms are presented in detail using ground magnetic field data and satellite measurements. This study highlights the role of external driving mechanisms in modulating the mid-low latitude space weather during geomagnetic storms.