

Monitoring Space Weather at low latitudes during the declining phase and minimum of solar cycle 24: studies in Mexico

J. A. Gonzalez-Esparza¹, E. Aguilar-Rodriguez¹, M. A. Sergeeva¹, P. Corona-Romero¹, L. X. Gonzalez¹, J. C. Mejia-Ambriz¹, J. J. González-Aviles¹, V. De la Luz², E. Romero-Hernández³, E. Huipe-Domratcheva⁴, E. Sánchez-García⁴, V. J. Gatica-Acevedo^{1,5}, R. Caraballo⁴, M. Rodriguez², O. Chang-Martínez¹, J. C. Villagrán-Orihuela⁶

¹LANCE, Instituto de Geofísica, Universidad Nacional Autónoma de México, Morelia, ²ENES, Universidad Nacional Autónoma de México, Morelia, ³LANCE, FCFM, Universidad Autónoma de Nuevo León, ⁴Posgrado en Ciencias de la Tierra, Universidad Nacional Autónoma de México, ⁵Instituto Politécnico Nacional, ⁶ESIA UNIDAD TICOMAN, Instituto Politécnico Nacional

Abstract:

The Mexican Space Weather Service (SCIEMEX) was established in 2014, and in 2016 the National Space Weather Laboratory (LANCE). One of the main objectives is the observation, monitoring, and warning of space events at low latitudes that can affect significantly the Mexican territory. SCIEMEX publishes a weekly report of space weather events, which is distributed on social networks, and also operates an early warning system for the National Civil Protection System. This early warning system is specific for events that might affect significantly the Mexican territory. On the other hand, LANCE is developing instrumental networks to provide data of different space weather phenomena: ionospheric disturbances, geomagnetic disturbances, cosmic rays fluxes, interplanetary disturbances, solar radio bursts, and geomagnetic induced currents in the national electricity grid. Based on this regional data and the use of international data sources, such as NASA and NOAA satellites' observations, we monitor the space weather phenomena affecting low latitudes. In this paper, we review the space weather events affecting Mexico from 2016 to 2021. This interval covers the descending phase and minimum of solar cycle 24 and the beginning of solar cycle 25. The main event in this interval is the solar flares and the geomagnetic storm in September 2017. The lessons learned in this period would provide information to prepare the ascending phase and maximum of solar cycle 25. This also helps us to better understand the space weather events at low latitudes.

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