

Latitudinal Variation of the Geomagnetic Field as Measured in South America During Three Intense Geomagnetism Storms

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The occurrences of intense geomagnetic storms are basically associated with Coronal Mass Ejections (CMEs), which is supposed to occur more frequently in periods of high solar activity. The current Solar Cycle 24 began in 2008, and the Sun reached maximum sunspot number in 2014. After this year, the Sun is in a period of low activity, and consequently, a low number of sunspots are observed. However, three intense geomagnetic storms ($Dst \leq -100$ nT) were detected in February 2014, March and July 2015, respectively. In this work, we have conducted a latitudinal variation study of the geomagnetic field intensity during these three intense geomagnetic storms as measured by the following selected Embrace Magnetometer Network stations: São Luís (MA), Eusébio (CE), Alta Floresta (MT), Cuiabá (MT), Jataí (GO), Vassouras (RJ), Cachoeira Paulista (SP), São José dos Campos (SP), and São Martinho da Serra (RS), set in Brazil, and Rio Grande (TF), set in Argentina. The results show that the lower values of the geomagnetic field intensity is around 22,500 nT at the Southern Space Observatory – São Martinho da Serra, located in the central region of the South American Magnetic Anomaly (SAMA). The higher variation of the horizontal component of the geomagnetic field is 509 nT in Cuiabá, and the lower variation is 17,896 nT in Vassouras.