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Preliminary studies of data and measurements from MAGDAS-9 magnetometer in Sri Lanka

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During the past few decades, the dip equator is showing a southward migration and Sri Lanka is one of the few countries in the world where the dip equator is crossing across the land. Therefore, Sri Lanka is a very important place to study geomagnetic variations. As a data gathering point for MAGDAS project, recently a MAGDAS-9 magnetometer has been installed in Sri Lanka inthe Dompe area, where the geographic coordinates of the location are 6.97°N, 80.07°E. Geomagnetic coordinates of the station are -1.65(latitude), 152.90(longitude). Latitude from geomagnetic dip equator is -0.34. The instrument has a Three-Component Ring-Core Flux Gate type magnetometer, which can measure the magnetic field in ±64,000 nT range. The noise level of the MAGDAS magnetometers areestimated to be 0.02 nTp-p. The instrument measures the magnetic field as three components in three axes horizontal (H), declination (D) and vertical (Z). The data acquisition rate is 10 measurements per second and each measurement is the mean of 25 samples and one measurement is taken for each second by taking the mean of 10 measurements. A preliminary study was done with the H-component of the geomagnetic variation around Sri Lanka. For the study, daily measurement data during March, April, and June, 2016, and March and April, 2017, were used, after removing abnormal noise values. Daily minimum, maximum and average values of the H-component of geomagnetic field measurements were calculated. The minimum, maximum, and average for 2016 March are 40750.84 nT, 41041.90 nT, and 40895.58 nT, respectively and those of April are 40797.48 nT, 41031.23 nT, 40899.04 nT, respectively. The minimum, maximum, and average for 2016 June are 40828.41 nT, 41042.60 nT, 40926.12 nT, respectively and those of 2017 March are 40887.82 nT, 41093.51 nT, and 40958.74 nT, respectively. The minimum, maximum, and average for 2017 April are 40860.93 nT, 41101.16 nT, and 40962.18 nT, respectively. The study shows that the geomagnetic field variation, within the specified time period was from 40750.84 nT to 41101.16 nT with an average of 40928.33 nT. For this specific study, solar quiet and solar disturbed geomagnetic variations were not considered separately. Further studies will be made to understand these variations with solar activity and those of measurements from other countries.

Keywords: MAGDAS-9, geomagnetic field variation, geomagnetic dip-equator.

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