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Characteristics of daytime medium scale traveling ionospheric disturbances (MSTIDs) as observed by SWARM

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This paper studies the daytime medium scale traveling ionospheric disturbances (MSTIDs) in the mid- and low-latitude ionosphere for a period of nearly half a solar cycle (2014-2019) using SWARM observations. We specifically focus on daytime MSTIDs to rule out any contribution from nighttime plasma irregularities. Fluctuations in electron density are primarily used to identify the MSTIDs. These wave like structures are independently observed in both electron density and magnetic fluctuations, although they do not always show one to one correlation. In most cases, the structures are observed by both satellite 'A' and 'C', suggesting that their zonal extent is more than 140 km. The study makes an attempt to understand and explain the magnetic conjugate nature of the MSTIDs. To have a better understanding of the dynamics of the MSTIDs, ground based GPS-TEC and ionosonde data has been used on case to case basis, wherever available. Additionally, spatio-temporal statistics of MSTID distribution is presented.

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