Geomagnetic storms and radio wave absorption in the equatorial region: a philosophical reinforcement

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Abstract

Investigations using radio waves reflected from the ionosphere at high-and mid-latitudes indicate that ionospheric radio wave absorption can strongly increase following geomagnetic storms; which appears to suggest some definite relationship between ionospheric radio wave absorption and geomagnetic storms at these latitudes. However, corresponding earlier studies in the equatorial region did not appear to show any explicit relationship between ionospheric radio wave absorption and geomagnetic storm activity. This position appeared acceptable to the existing scientific paradigm, until in an act of paradigm shift, by a change of storm selection criteria, two more recent space weather investigations in the low latitudes showed that ionospheric radio wave absorption in the equatorial region clearly increases after intense storms. Given that these results in the equatorial region stood against the earlier results, this paper presently attempts to highlight their philosophical underpinning and posit that they constitute a scientific statement.