World Academy of Science, Engineering and Technology
International Journal of Mathematical and Computational Sciences
Vol:14, No:12, 2020

Statistical Estimation of Ionospheric Energy Dissipation Using ØStgaard's Empirical Relation

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Abstract : During the past few decades, energy dissipation in the ionosphere resulting from the geomagnetic activity has caused an increasing number of major disruptions of important power and communication services, malfunctions and loss of expensive facilities. Here, the electron precipitation energy, w(ep) and joule heating energy, w(jh) was used in the computation of this dissipation using Østgaard's empirical relation from hourly geomagnetic indices of 2012, under the assumption that the magnetosphere does not store any energy, so that at the beginning of the activity t1=0 and end at t2=t, the statistical results obtained show that ionospheric dissipation varies month to month, day to day and hour to hour and estimated with a value ~3.6 w(ep), which is in agreement with experimental result.

Keywords : Ostgaard's, ionospheric dissipation, joule heating, electron precipitation, geomagnetic indices, empirical relation
Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development
Conference Location : Chicago, United States
Conference Dates : December 12-13, 2020