Geophysical Research Abstracts
Vol. 21, EGU2019-7216, 2019
EGU General Assembly 2019

Main drivers and interhemispheric circulation of TIDs

Dalia Buresova (1), Anna Belehaki (2), Jurgen Watermann (3), Ivan Galkin (4), Ioanna Tsagouri (2), Daniel Kouba (1), David Altadill (5), Estefania Blanch (5), Tereza Sindelarova (1), Jaroslav Urbar (1), John Bosco Habarulema (6), Zama Katamzi (6), and Dana Saxonbergova-Jankovicova (1)

(1) Institute of Atmospheric Physics, Czech Academy of Sciences, Bocni II 1401, 14100 Prague, Czech Republic , (2) National Observatory of Athens, IAASARS, Metaxa and Vas. Pavlou, Palaia Penteli 15236, Greece, (3) JFWCONSULT, La Tetrade, 443 Chemin de Pichot, Tourrettes, 83440, France, (4) University of Massachusetts Lowell, Space Science Laboratory, Lowell, MA 01854, USA , (5) Observatori de l'Ebre (OE), Univ. Ramon Llull - CSIC, Hora Alta 38, 43520 Roquetes, Spain , (6) SANSA Space Science, Hospital Street, Hermanus 7200, South Africa

Definition of the main TID drivers in the geospace and the Earth's atmosphere and hemispherical circulation of TIDs are among the major challenges of the project TechTIDE supported by the European Commission Horizon 2020 research and innovation program that will advance our scientific understanding of the TID formation and propagation mechanisms and will support the identification, verification and early warning systems. The post-analysis was used to identify the drivers of TIDs. We analysed data from different kinds of available observations to get a realistic representation of the state of the environment before and at the time of the event. The main TID drivers are: geomagnetic storms (CME- CIR/HSS-related events), auroral activity, polar cusp electrons and protons, troposphere - ionosphere coupling (drivers of meteorological origin), seismic activity, solar terminator, eclipse, anthropogenic sources. The analysis is considering drivers for LSTID and for MSTID based on data from open data repositories and events catalogues. This paper deals with several most efficient TID drivers. In order to obtain quantitative information on the likeliness and morphology of interhemispheric circulation of TIDs 38 events were examined lasting between 8 and 24 hours each, during which TID were observed according to the TID occurrence list prepared in the frame of the TechTIDE project. We used exclusively GPS-based detection methods, specifically information on TEC, TEC deviations in space and time from a background reference (dTEC), and the Rate of TEC change in time (ROT), all inferred from GPS receiver networks in Europe and Africa. Under the constraint that our data sample was heavily biased toward geomagnetic storm time events we conclude that hemispheric conjugacy of LSTID is highly probable while interhemispheric circulation rather unlikely but still occurring during some periods.