



TechTIDE: Warning and Mitigation Technologies for Travelling Ionospheric Disturbances Effects

Anna Belehaki⁽¹⁾, Ivan Galkin^{(2),(3)}, Claudia Borries⁽⁴⁾, Pedro Pintor⁽⁵⁾, David Altadill⁽⁶⁾, Jaume Sanz⁽⁷⁾, J. Miguel Juan⁽⁷⁾, Dalia Buresova⁽⁸⁾, Tobias Verhulst⁽⁹⁾, Jens Mielich⁽¹⁰⁾, Zama Katamzi-Joseph⁽¹¹⁾, Juergen Watermann⁽¹²⁾, Haris Haralambous^{*(13)}, and Stefan Unger⁽¹⁴⁾

(1) National Observatory of Athens, IAASARS, Palaia Penteli 15236, Greece e-mail: belehaki@noa.gr

(2) Borealis Global Designs, Varna, Bulgaria

(3) Space Science Laboratory, University of Massachusetts Lowell, United States

(4) German Aerospace Center, Neustrelitz, Germany

(5) European Satellite Services Provider, Madrid, Spain

(6) Observatori de l'Ebre, (OE), CSIC - Universitat Ramon Llull, Roquetes, Spain

(7) Universitat Politècnica de Catalunya, Barcelona, Spain

(8) Institute of Atmospheric Physics, Academy of Sciences of Czech Republic

(9) Royal Meteorological Institute (RMI), Ringlaan 3, Brussels, B-1180, Belgium

(10) Leibniz Institute of Atmospheric Physics, Kühlungsborn, Germany

(11) South Africa National Space Agency, Hermanus, South Africa

(12) Watermann Juergen Friedrich Wilhelm, Tourrettes, France

(13) Frederick University, Nicosia, Cyprus e-mail: eng.hh@frederick.ac.cy

(14) Radio Surveillance Section, German Federal Police, Germany

Travelling Ionospheric Disturbances (TIDs) are ionospheric manifestations of internal atmospheric gravity waves (AGW) in the neutral atmosphere driven by near-Earth space dynamics and by lower atmosphere phenomena. They constitute a threat for operational systems such as precise navigation (e.g., EGNOS and N-RTK) and high frequency geolocation as they can impose disturbances with amplitudes of up to ~20% of the ambient electron density, and Doppler frequency shifts of the order of 0.5 Hz on HF signals. The Horizon 2020 Project TechTIDE (<http://techtide.space.noa.gr/>) funded by the European Commission aims at designing and testing new viable TID impact mitigation strategies for the technologies affected by developing a system able to calculate in real-time the main TID characteristics (velocity, amplitude, propagation direction), to realistically specify background ionospheric conditions and to specify those ionospheric characteristics whose perturbation, because of TIDs, cause the impact in each specific technology. The TechTIDE system will contribute new understanding of the physical processes resulting in the formation of TIDs, and will consequently help to identify the drivers in the interplanetary medium, the magnetosphere and the atmosphere. This paper will provide a description of the instrumentation involved and outline the project methodologies for the identification and tracking of TIDs based on the exploitation of real-time observations from networks of Digisonde, GNSS receivers and Continuous Doppler Sounding Systems.

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