Geophysical Research Abstracts
Vol. 14, EGU2012-12852, 2012
EGU General Assembly 2012

Multi-satellite DORIS receivers for improved ionospheric specification

T. Gaussiran (1), D. Rainwater (1), and B. Barnum (2)

(1) Applied Research Laboratories, SGL, Austin, TX, United States (gauss@arlut.utexas.edu), (2) Johns Hopkins Applied Physics Laboratory, Laurel, MD, United States

Study of the upper and lower atmosphere has advanced to the point where a compelling need has emerged for global real-time specification of the most important observations as inputs to climate models. For the ionosphere, plasmasphere and magnetosphere this is the local free electron density (ED); for the troposphere it is the local water vapor content (WVC). We describe a proposal for a DORIS receiver to be flown on the Iridium-NEXT constellation. It would provide precise, real-time global maps of 3-D ED and of WVC, as well as ionospheric scintillation. We emphasize the ionospheric feature sizes that could be resolved, 100 km scale or less horizontally; and how the data sets obtained could help illuminate the transition from persistent to turbulent structures. Iridium-NEXT is a constellation of 66 satellites in six polar orbit planes, deployed starting in 2015. We describe how the DORIS frequency lever arm is superior to that of GPS for probing the ionosphere, and how DORIS data is currently being used to generate WVC data sets of comparable precision to GPS and VLBI data. GEOScan data would be persistent, global and real-time. Its data would be made available publicly in near-real-time. This data set would be an important step in taking real-time ionospheric studies from a synoptic view to the mesoscale.