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Capabilities of SWACI as an essential component of EURIPOS

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EURIPOS as a European research network of an ionospheric and plamaspheric observation system relies on the well established European vertical sounding network and an equivalent network of numerous receivers of signals from Global Navigation Satellite Systems (GNSS) such as GPS and Galileo. According to this base line EURIPOS is assisted by current ionospheric services such as DIAS (Digital Upper Atmosphere Server) and SWACI (Space Weather Application Center Ionosphere) operated by NOA and DLR, respectively.
This paper shall demonstrate the capabilities of SWACI providing an essential basis for supporting the enhanced service by EURIPOS.
The current SWACI service operates a powerful data processing system working both in real-time and post-processing modes in order to provide actual information to the customers (http://w3swaci.dlr.de). Typical data products include ground based GNSS derived European maps of the Total Electron Content (TEC) and corresponding derivatives such as latitudinal and longitudinal gradients and rate of change, updated every 5 minutes. Space based retrievals include radio occultation data as well as a 3D reconstruction of the topside ionosphere between CHAMP orbit and GPS satellite orbit height.
The different types of products are described and discussed in relation to EURIPOS requirements and objectives. Emphasis is given to new products which may be created by combining vertical sounding and TEC data. The resulting equivalent slab thickness is discussed by combining ionosonde data from Juliusruh with corresponding TEC data extracted from the TEC maps. EURIPOS shall provide this valuable shape parameter in near real time at several vertical sounding stations. The dynamics of the profile shape is important for studying ionospheric storms. The capabilities of SWACI for monitoring and studying ionospheric storms observed since 2000 will be demonstrated.