



GIOMO - Evaluation of Near Real-Time Ionospheric Models

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Recently the project GIOMO (next Generation near real-time IONospheric MOdels) was launched by the Institute of Geodesy and Geophysics (TU-Vienna), the Teleconsult Austria company, the Austrian Academy of Sciences and the University Center Rottenmann as contributing partners. GIOMO is funded by the Austrian Research Promotion Agency (FFG) and the goals of the project are the identification and consolidation of improved ionospheric modelling technologies focusing on regional and local scales. In a further step the identified optimum modelling technique will be implemented as standard into the existing OEGNOS (Austrian EGNOS Service) software. OEGNOS is an operational regional augmentation service which distributes EGNOS corrections tailored to the Austrian Alps Region by surface broadcasting techniques in order to improve the positioning accuracy.

Based of a state-of-the-art analysis of existing and in real-time available ionospheric models a candidate model will be selected as well as possible refinement procedures. The observation data used for refinements will be GNSS observations of a regional 40 stations reference network with a mean station distance of about 70km. The suite of investigated models cover typical single layer models of the VTEC derived from GNSS data like the IGS VTEC spherical harmonic expansion as well as regional densifications by means of Taylor-series. Another choice is a 3-dimensional series expansion of electron density by means of B-splines. Last but not least the existing 3D-electron density models NeQuick and the more complex COSTprof model will be investigated.

This presentation deals with early results of the project GIOMO which are in the first place comparisons of the electron density predicted by the various models and secondly the potential of the models for interpolation and densification to regional scales by means of introducing regional GNSS observation data. To evaluate the results GNSS site observations (network size 600km times 300km) will be processed just utilizing the single frequency data together with the electron density models. Stations coordinates and their repeatability are finally compared to their reference obtained from a dual-frequency approach.