



Regional Ionosphere Maps over Austria using the Kriging Interpolation Technique

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The ionosphere is a portion of the upper atmosphere and has the characteristics of getting easily ionized by solar radiation. Variations of the solar activity change the conditions of the Sun-Earth environment and can dramatically disturb the ionospheric mean conditions. These ionospheric disturbances will significantly increase in the forthcoming years due to reaching the solar maximum at around 2013. The ionosphere plays an important role in high-technological systems for navigation, telecommunication and space missions because the microwave signals travelling through it experience a delay that depends on the number of free electrons along the ray path. Space geodetic techniques observing at two frequencies, such as the Global Positioning System (GPS) allow the observation and modelling of the ionosphere, which is a key point in correcting electromagnetic measurements for ionospheric disturbances. The kriging interpolation method is an estimation and interpolation method applied in geostatistics, which uses known sample values and a variogram to determine the unknown values at different locations. At each location kriging produces an estimate and a confidence bound on the estimate. This study aims at developing regional maps of Vertical Total Electron Content (VTEC) over the Austrian GNSS network using the kriging interpolation method. To validate the developed maps, comparisons with other regional and global maps, that are developed using different techniques are performed.