



GPS-based ionospheric TEC mapping over Algeria: Comparison with the IAACs TEC maps solutions

H. Dekkiche, S. Kahlouche, C.B. Kadri

Geodesy Division, Space Technique Center, Algerian Space Agency, Arzew, Oran, Algeria
dekkichehicham@yahoo.fr

Total Electron Content (TEC) values may be considered as a key to monitor the behaviour of the ionospheric medium. Nowadays continuous GPS observations can provide an efficient tool to monitor timely and spatially TEC variations. In this paper, we investigated the use of dual frequency GPS observations provided by the regional ALgerian GEOdynamical NETwork (ALGEONET) to calculate TEC maps over the north of Algeria. Data of five ALGEONET and a hundred IGS stations are processed with the Bernese GPS software. The used model supposes that the whole free electrons are concentrated on a thin spherical layer to an altitude varying between 250 and 450 km. Results are obtained for several heights of the layer (350 Km, 400 Km, 450 Km) with an 2-hourly resolution. Regional ionosphere model (ALGEONET) was created and compared with the different solutions delivered by the five IGS Ionosphere Associate Analysis Centers (IAACs). The obtained results show that the differences between the diverse models are about 10 TECU. The general trend is that the regional model (ALGEONET) differs least from the CODE one. The ALGEONET TEC maps agree very well with the UPC solutions, too. The maximal value of the obtained TEC in the north Algerian area is about 20 (midnight) to 60 (midday) TECU, such values are obtained for the day of 30 April 2001 which refers to a high solar activity period with a sunspot number of 112. The study of the ionosphere model dependency from the chosen height of the single layer has shown that the ALGEONET TEC maps are not sensitive to the tested heights of the layer (300, 400 and 450 km).