



Differential ionosphere modeling for single-reference long-baseline GPS kinematic positioning

H. Dekkiche, S. Kahlouche, H. Abbas, M.I. Kariche

Geodesy Division, Space Technique Center, Algerian Space Agency, Arzew, Oran, Algeria

dekkichehicham@yahoo.fr

The ionospheric effect is considered like one of the most important error sources limiting the quality of GPS kinematic positioning. Over longer distances, differential ionospheric residuals become larger and may affect the ambiguity resolution process. This paper presents a kalman-filter-based GPS ionosphere modelling for long baseline kinematic applications. The used observation model includes differential ionosphere as an additional unknown with position coordinates and ambiguities, while the temporal correlations of the state vector are specified in the dynamic model. The temporal behaviour of ionospheric residuals is determined by the analysis of their autocorrelation function. The developed method was applied on a set of data collected by a roving receiver in the Oran's (Algeria) offshore. The obtained results show that baselines of about 80 km were determined, in single-reference-station mode, with an accuracy of a few centimetres.