



Signal characteristics in coordinate time series of GPS-DORIS co-located stations

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Weekly time series of coordinate residuals are analysed using the wavelet transform in order to investigate the signal of the nonlinear station motion of 14 GPS-DORIS (Global Positioning System-Doppler Orbitography and Radiopositioning Integrated by Satellite) co-located stations over 2006.0 - 2011.8. The data used were computed by IGN/JPL (Institut Géographique National, France/ Jet Propulsion Laboratory, USA) using the GIPSY-OASIS II software package, referred to ITRF2005 and expressed in the local geodetic reference frame.

The Multi-resolution analysis has assessed well the nonlinear trends and the seasonal signals in the studied time series. The horizontal displacements (North and East) of the stations are mainly associated to the plate tectonics and the vertical displacements are associated to the local subsidence or postglacial rebound. However, the error due to the period of 118 days was not hopefully removed in the ign09wd01 solution for the totality of DORIS stations.

Using the VisuShrink method with soft thresholding, the obtained results show that the DORIS positions are more distorted than those of GPS. Indeed, the standard deviation of the noise in respectively North, East and Vertical components is in the range of 1-2, 0.5-1 and 2-4 mm for GPS and 6-11, 5-17 and 6-15 mm for DORIS. For DORIS positions, the noise level in the East component is more important compared to the North and the Vertical ones and it is small in the stations at high latitude relatively to the other ones.

Keywords: DORIS; GPS; Station coordinates; Wavelets; Multi-resolution analysis; De-noising.