



Effects of the tropospheric horizontal gradients on GPS coordinates estimation: a case study for severe storms conditions.

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The neutral layer of the atmosphere causes a vertical delay on the GNSS signals typically of about 2 meters, and up to one order of magnitude more in slant directions. Over the last past decade there has been shown that this quantity has an azimuthally asymmetric behavior that can systematically affect the precise positioning as well as lead to misinterpreting the repeatability of the site's coordinates. We are currently showing on this present work how this parameter is estimated with an in-house software and its performance is being compared to results from JPL's software (GIPSY 6.2).

This scenario will be applied on a case study for the recent Harvey hurricane where gradients, i.e. azimuthal ZTD variations, of up to 1 centimeter have been found. Moreover, we are showing the impact on the coordinates estimation when different processing strategies such as PPP (static and kinematic) or relative precise positioning are applied. The conclusions confirm the convenience of estimating ZTD horizontal gradients during strong weather events for avoiding a degradation of the quality of the precise GPS positioning.