



How does the non-linear estimation of periodic terms improve the detection of offsets in GNSS position time series?

Xavier Collilieux (1), Emilie Lebarbier (2), David Coulot (1), and Etienne Bernard (1)

(1) IGN, Univ Paris Diderot, Sorbonne Paris Cité, LAREG, Paris, France (xavier.collilieux@ign.fr), (2) AgroParisTech UMR518, Paris, France

GNSS position time series computed from permanent station observations have been shown to be affected by a significant number of offsets that can be explained (equipment changes, antenna malfunction, earthquakes) or not. If not corrected, velocities or inter-annual signals estimated from the series will be biased. In addition to these offsets, GNSS position series show dominant periodic signals at seasonal and specific frequencies related to real ground displacements or systematic errors. As a consequence, it is relevant to estimate both the frequencies of the periodic signals and the positions of the offsets. This supplies a synthetic description of the series and should improve the velocity determination.

In this poster, we propose to study two methods that rely on two different approaches on real and synthetic series in order to solve this problem. We then propose to quantify if the estimation of low-frequency signals could help to improve the offsets detection.