The Detection of Offsets in GPS Experiment (DOGEx): Call for Participation

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The accuracy of Global Positioning System (GPS) time series are degraded by the presence of offsets. If these are not detected and adjusted correctly they bias velocities, and hence geophysical estimates, and degrade the terrestrial reference frame. They also alter apparent time series noise characteristics as undetected offsets resemble a random walk process. As time series precision improves, the influence of uncorrected offsets increases; offsets are now a substantial problem in geodesy, especially GPS. A number of automated offset detection algorithms have been developed across a range of fields, and some of these are now being tested in geodetic time series. While automated detection may not be able to detect 100% of offsets, the relative effectiveness of various techniques remains to be tested in an objective manner.

Here, we announce a community experiment in detecting offsets in GPS time series. We have produced simulated 3-d GPS coordinate time series for 50 "sites". The simulated series contain realistic (and perfectly known) GPS signal, noise, offset frequencies and data gaps. Noise characteristics are modelled on that present in state-of-the-art GPS reprocessing solutions using a "white plus flicker" noise model, although the noise is not necessarily time-constant at each site.

Importantly, the true offset times and site velocities will not be provided to the community. Rather, we invite those working on automatic offset detection algorithms to download the time series from http://www.cost-es0701.gcparks.com/working-groups/wg and submit to us the offset epochs for each site. At regular intervals (IGS workshops, EGU, AGU) we will update the community on the the best approaches and the effects of undetected or mis-detected offsets on GPS time series, velocities and apparent noise.

In this poster we will demonstrate the performance of a few of the offset detection approaches on a variant of the publicly released data set.

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