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Noise characteristics of short-duration, high-frequency GPS records

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In order to investigate the noise characteristics of short duration (10 to 104sec), high frequency ($\geq$10Hz) GPS records, usually corresponding to signals of earthquakes and of oscillations of various structures, we made systematic experiments using identical, highly collocated GPS stationary rover receivers and a nearby base receiver. The obtained kinematic records revealed strikingly different signals describing the noise, both in the raw and in the processed data. Analysis of these data revealed that the short duration, low frequency (below $\sim$0.2Hz) components of the GPS records are dominated by coloured noise, but their high-frequency components (above $\sim$2.5Hz) contain only white noise. This result puts some constraints in the use of GPS for short-duration recordings, for instance efficiency in identification of dynamic, but not of small amplitude, semi-static movements.