

Noise evaluation of high-speed sampling GPS observation: Applicability to broad-band seismometer

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High-speed sampling GPS observation could be used as a broad-band displacement seismometer. For this purpose it is necessary to evaluate the noise level, which is inherent to the GPS observation such as ionospheric, tropospheric, multi-path and satellite configuration. In this study, we develop the continuous high-speed sampling GPS observation system, and investigate the noise level of time series of GPS station coordinates by the GPS kinematic method. Noise reduction for each noise source has been innovated, and noise levels of horizontal and vertical components after the reduction are about ± 4 mm, ± 7 mm, respectively in the case of 150km baseline length. This means that the earthquake larger than magnitude 5.9 at least can be detected at a GPS station 60 km away from the epicenter.