

## Long-range kinematic GPS survey by connecting short baselines

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Long-range kinematic GPS survey is essential when seafloor deformation measurements using GPS/acoustic techniques are conducted, because most plate boundaries around Japan run 100-200km offshore. First in this study we check the effect of SA release from the data obtained under SA-on and SA-off. Next, we evaluate accuracy decrease of kinematic GPS survey with increasing distance. Finally we propose a long-range kinematic GPS survey that connects short baselines via relay stations. Through all experiments 1sec-sampling data are collected at several fixed stations at different distances on land and all data are analyzed by KINGS (KINematic Gps Software) developed at the National Aerospace Laboratory.

The impact of SA release is so large that apparent horizontal position change within 1hour is decreased from 6.6cm in rms under SA-on to 1.4cm under SA-off when baseline length is 70km. At the same time deviation from true position is drastically decreased. However, accuracy is still insufficient for longer distance even under SA-off, for example, about 2.8cm in 1hour-rms for the 100km baseline. We can decrease the error down to 1.5cm by dividing the baseline into two 50km-long baselines and connecting those via relay station. It is expected to attain the accuracy of 1.8cm for 200km-long baselines by connecting four 50km-long baselines via three moving relay stations, applicable to the GPS/acoustic seafloor deformation measurements.