



Effect of Span of GPS Campaigns on Estimated Static Positioning Velocities

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Episodic/periodic GPS campaigns are still used in geodetic research due to constraints/limitations in availabilities of many folds. One known application area is deformation monitoring in a tectonically active region. In some studies, still about 10 h of GPS data is gathered as a tradition during one GPS campaign, and GPS results obtained in the form of one-solution-per-year from naturally several but sometimes from only a couple of successive years are used to estimate horizontal and vertical velocities. Today with a network of about 400 continuously operating GPS stations and about 20 years of GPS time series, IGS allows researchers to study the quality of GPS solutions. This way, previously, the useful observing session duration for the GPS campaigns was reported as minimum 12 hours, and the accuracy loss in velocity estimation due to using shorter observing session durations was shown. In this study, we further investigate the effect of the span of GPS campaigns (length of successive years from which GPS velocities are estimated) over estimated velocities. We assess how GPS velocities obtained from typical three-year research project periods are influenced. We use GIPSY/OASIS II research software developed by JPL/NASA to process the GPS data obtained through SOPAC which is one of the global data and analysis centers of IGS. Our preliminary results indicate that reliable deformation rates can only be obtained if the GPS campaigns are continued as long as 8 years on average for the horizontal motion and 10 years for the vertical one. Longitude exhibits poorer results relative to latitude, and the height is the poorest of all as expected.