Estimation of The Scale Factor For Short Observing Session Duration In GNSS Positioning

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In recent years, users prefer Global Navigation Satellite System (GNSS) technique rather than traditional techniques for geodetic applications. Accuracy of GNNS observations depends on several parameters such as surveying method, data processing strategy and software. GNSS observations are generally processed by using academic software or commercial software. Commercial software can provide solution up to 20-25 km baseline length. Moreover, academic software is preferred for scientific researches as monitoring of the movements of manmade structures or plate tectonic that are required high accurate point positioning. However, academic software gives optimistic results in terms of positioning accuracy. This situation causes wrong interpretations for important decision in deformation analysis. Therefore, the variance-covariance (VCV) matrices that are obtained from academic software should be scaled. In this study, the estimation of the scaling factor was carried out for short observing session duration in GNSS positioning. Baselines whose lengths ranging from 8 km to 268 km and session durations between 60 min and 180 min were processed using Bernese v5.2 with single baseline strategy. According to initial results, a significant dependence based on baseline lengths cannot be determined. Moreover, the results show that scaling factor changes depending on the session duration.

Keywords: Relative Positioning, Short Observing Session Duration, Scale Factor, Bernese