

Investigation of the Solid Earth Tide Based on GPS Observation and Superconducting Gravimeter Data

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Abstract. According to Zheng (2006), vertical displacement caused by the solid earth tide often reaches in range 20 cm, and can exceed 30 cm in some stations. To measure solid earth tide we can use satellite system or sensitive gravimeters (Ito et al., 2009). This paper aims to investigate solid earth tide based on Global Positioning System (GPS) data compare with Superconducting Gravimeter (SG) data and solid earth tide global model. Processing GPS data using Kinematic Precise Point Positioning (KPPP) method within a year data from 1st January – 31st December 2011. We use BAKO GPS Permanent station data and Cibinong SG Station data. The location of BAKO station is close to Cibinong SG station, which is about 50 meters. The result of this paper are solid earth tide which is derived from both devices have the same pattern, and it is dominated by semi-diurnal components. Applicability global models with SG observations has smaller residue with standard deviation is 0.009771 mgal, this result is equivalent with 0.031269 meter. Comparison between the results of GPS observations to global models which have a standard deviation residue for vertical component is 0.0360 meters.

Keywords: *Solid Earth Tide; GPS Permanent Station; Kinematic Precise Point Positioning; Superconducting Gravimeter.*