

Tidal gravity observed with superconducting gravimeter in Cibinong, Indonesia

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International observation project GGP(Global Geodynamic Project) using superconducting gravimeters(SGs) that has high sensitivity ($1 \text{ ngal} = 1.0^{11} \text{ m/sec}^2$) and long-term stability is progressing to research the earth deep dynamics. The SG station in Bandung was established by Kyoto University in 1997. It was the unique GGP station in the equatorial region and especially expected to the studies of the phenomena with latitudinal dependencies. However, the SG in Bandung was break down due to flooding which occurred in March, 2004. In November, 2008, we established the SG station in BAKOSURTANAL(National Coordinating Agency for Surveys and Mapping), Cibinong and restarted the SG observation. The SG is in good health and observation data have been accumulating without troubles.

In order to see tidal gravity and long-term gravity variation, we made tidal analyses using the SG data in Cibinong between 27, November, 2008 and 9, September, 2009. The data were filtered and re-sampled to obtain a 1-hour interval data set and the tidal analyses were made by employing "BAYTAP-G" software (Tamura et al., 1991) for short period waves and "BAYTAP-L", which is the long period version of the "BAYTAP-G", for long period waves.

Calculated RMSE of tidal parameters of short period waves are 0.00012(M2)-0.05223(P1) in factor, 0.006(M2)-2.916(PH1) degree in phase, and 0.004(S1)-0.029(O1,P1) microgal in amplitude. And those of long period waves are 0.0140(MF)-0.3541(MSM) in factor, 0.73(MF)-18.92(MSM) degree in phase, and 0.0225(MQM)-0.4225(MM) microgal in amplitude. These RMSE are about five times larger than those in Bandung and the SG data length used for tidal analyses in Bandung are about five times longer than those in Cibinong. Therefore, the SG observation data in Cibinong are as good as in Bandung. The residuals excluded the tidal component whose periods are lower than a month from the SG data have annual variations with about 10 microgal amplitude. These variations include long period tidal waves such as SSA, SA, and pole tide.

Moreover, we report the comparison of the tidal parameters in Cibinong with ocean tide model such as GOT00.2, FES2004, CSR4.0, NAO99.b and TPX07.2.