

On the effect of higher-order terms in the gravity sensor of the superconducting gravimeter

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The superconducting gravimeter CT #036 operated at the VERA Ishigakijima station, Okinawa, Japan, indicates several kinds of behaviors characteristic to this site. Imanishi et al. (2018), by developing a theoretical model for the static and dynamic properties of the gravity sensor, showed that the effect of the movements of a nearby VLBI antenna on the gravimeter is explained quantitatively by the coupling between the horizontal and vertical components in the gravity sensor. However, it remained unresolved whether the apparent gravity increase associated with enhanced ground noise, as typically seen when typhoons approach the Ishigakijima island, is explained by the same model, because the magnitude of the higher-order terms representing vertical nonlinearity were unknown. Here we will report our result on the measurements of the higher-order terms obtained by injecting artificial signals to CT #036, and discuss its impact on the dynamic properties of the gravity sensor.

Keywords: superconducting gravimeter, Ishigakijima, nonlinearity