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相対重力データに対する陸水擾乱補正の重要性：桜島火山を例に
The importance of hydrological disturbance corrections for relative gravity data: A case study at Sakurajima Volcano

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An empirical water balance model was created to correct for hydrological disturbances in relative gravity data repeatedly measured at Sakurajima Volcano, southern Japan. This study aims to quantitatively monitor gravity signals due to magmatic activities of Sakurajima Volcano, and we here present the first applied results of the empirical model. The hydrological disturbances were simply calculated by the product of the instant gravity response to unit precipitation and land water storage, which were estimated using digital topography and observed meteorological data. The calculated hydrological disturbance was consistent with the observed absolute gravity data at Harutayama Station from 2010 to 2011 within 8 micro-gal (1 [micro-gal] = 1 E-8 [m/s2]), which was smaller than the typical accuracy of relative gravity measurements (~10 micro-gal). In addition, after we subtracted (i.e., corrected) the calculated disturbances from the measured relative gravity data at Sakurajima Volcano, the average amplitude of the corrected gravity changes during 2007-2009 was reduced by 90 % compared with that of the original gravity data. Since gravity changes have been measured using both absolute and relative gravimeters at volcanic areas these days, hydrological disturbance corrections should be applied to the relative gravity data, not only to the absolute one. By sophisticating the effects of spatiotemporal variations in precipitation, evapotranspiration, and infiltration capacity, this model will enable us to robustly monitor long-period and wide-spread gravity variations associated with volcanic activities.

キーワード: 桜島火山, 重力変化, 陸水擾乱, 相対重力測定, 絶対重力測定, 浸透能
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