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Modeling of two-dimensional density structure in eastern Taiwan

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Taiwan is located on the tectonic boundary between the Eurasian Plate and the Philippine Sea Plate. The northern terminus of the Philippine Mobile Belt is in Taiwan, where accreted parts of the Luzon Arc and Luzon forearc form the Huatung Longitudinal Valley and the eastern Coastal Range of Taiwan, respectively.
The Huatung Longitudinal Valley is a complex collection of tectonic plate fragments and volcanic intrusions. Besides, the distribution of the positive gravity anomalies is in the vicinity of Huatung area and there show the maximum value of the Bouguer gravity in this area. In this study, we use the gravity forward and inversion method to investigate two geological profiles in Ruisui and Yuli area of the Huatung Longitudinal Valley.
In order to derive the reliable density structure, we examine several geophysical and geological profiles using the Bouguer anomaly value along each profile. In modeling of subsurface density structure, available seismic and well data are used to possibly constrain the geometric and/or densities. The effect of two-dimensional density model is calculated using the Talwani technique. Then, we use tried and error method to modify the model and finally get a reliable density structure that conform with observed gravity data.
The Bouguer gravity increases eastward from the Central Mountain Range to eastern Taiwan offshore. The depth of strata and fault location in Ruisui and Yuli area of the Huatung Longitudinal Valley will be obtained by gravity modeling. Moreover, the results shows igneous rock existing beneath the Huatung Longitudinal Valley area and it extends along with the depth to the east. In short, it is the cause of the highest gravity anomalies in Taiwan. If more velocity structure, seismic and drill data constrained, we expect to derive the more detailed subsurface structure and deep strata information in this area using gravity data modeling.