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## Deep crustal structure in the Taiwan-Ryukyu arc-trench system junction area: determined from gravity modeling

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Arc-continent collision and post-orogenic extension are both currently in progress in different parts of the Taiwan mountain belt. In particular, the junction of eastern Taiwan and the southernmost Ryukyu arc-trench system is a complex tectonic region where the Philippine Sea Plate (PSP) changes from overriding the Eurasian Plate (EUP) to subducting beneath the EUP. The Taiwan Integrated Geodynamic Research (TAIGER) program collected two wide-angle and multi-channel seismic transects (T5 and T6) across the Taiwan mountain belt and the western end of the Ryukyu arc-trench system, which provide good constraints on the seismic velocity structure of the crust. However, due to the resolution problems, the detailed deep structures are not fully understood, especially offshore eastern Taiwan and in the southernmost Ryukyu fore-arc area, where seismic activity is frequent. In this study, we perform 2-D gravity modeling along these two P-wave ( $V_p$ ) transects, which not only helps to reduce the non-unique problem but also provides a possible solution for the deeper structures where the velocity model is not well constrained. Conversion of the P-wave velocity to density allows us to model the gravity anomaly and then provide a likely density model for the study area. Gravity modeling along profile T5 shows relatively high-density ( $3.10 \text{ g/cm}^3$ ) material beneath eastern Taiwan under the Longitudinal Valley between the Central Range and the Coastal Range. The source of this high-density material could be serpentinized mantle, with serpentinization caused by the dehydration of the subducting Eurasian Plate. Along profile T6, the revised density model indicates that the subducting Gagua Ridge has a deep crustal root and extends northward to the Ryukyu fore-arc area.