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Low velocity anomaly near bottom of the crust benearth the Kyushu Mountains

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We present high-resolution 3D tomographic images of the crust beneath the entire Kyushu arc, and particularly the western portion. Our results reveal a velocity anomaly that correlates well with an upper crustal gravity anomaly. Significant low-velocity anomalies exist beneath the Miyazaki plane and along the Beppu-Shimabara Graben. Another extensive low-velocity region near the bottom of the crust is located just below the volcanic front and between active volcanoes. The low-velocity anomalies exhibit low Vp and Vp/Vs characteristics, and the spatial relationship between these anomalies, the Bouguer gravity anomaly, and the Moho suggests that low-density material at the base of the crust is responsible for both the seismic and gravity signatures. We interpret this material to constitute a relict ridge subducting below the Kyushu Mountains.

Keywords: tomography, Kyushu, velocity structure, Kyushu Mountains, Moho discontinuity, Kyushu-Palau Ridge