Deep structure of active volcanoes in Kyushu

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We have applied a tomographic method to about 9000 arrival times from 486 earthquakes to determine a detailed 3-D P-wave velocity structure under Kyushu. We found that (1) The Philippine Sea slab is imaged clearly as a high-velocity zone with a thickness of about 35 km. (2) Very slow anomalies are visible in the crust and mantle wedge beneath active volcanoes, indicating that magmatism in Kyushu is related to the convective circulations in the mantle wedge and dehydration reactions in the subducting slab. (3) Large crustal earthquakes occurred in the vicinity of low-velocity zones, indicating that volcanoes and magma chambers weaken the brittle seismogenic crust, and cause those weak areas subject to the tectonic stress and prone to large earthquakes.