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# Slab shapes beneath Izu-Bonin, Mariana, Kuril-Kamchatka, Aleutian, Sunda arcs and Taiwan from regional tomographic inversions

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We present new models of P and S velocity anomalies down to 1200 km depth for several subduction zones (Izu-Bonin, Mariana, Kuril-Kamchatka, Aleutian, Sunda arcs and Taiwan) based on tomographic inversion of global travel time data from the revised ISC catalogue. The inversion results were verified using a series of different tests and compared with previous studies of different authors. The derived models generally agree with other previously published regional models, but in details our models have some features. In all subduction zones, the P and S seismic tomography models consistently display the slab as prominent high-velocity anomalies coinciding with the distribution of deep seismicity. These models show that slab thickness, seismicity and dip angles of slabs are strongly variable in depth and in the lateral extent, which might indicate to segmentation of the slab. Gentle angle of the slab dipping beneath Izu-Bonin and almost vertical dipping beneath Mariana arc is mainly explained by displacement (advancing and retreating) of the trench. Based on results for these zones, we suggest reconstruction of the plate interactions and the subduction development which explains present shape of the slab. Horizontal movement of the slab in the transition zone and its thickening beneath south part of the Kuril-Kamchatka is explained by "plate pushing" mechanism, whereas thinning of the lithosphere and its steep penetration to the lower mantle beneath north Kuril and south Kamchatka is explained by the "gravitational pull" mechanism. In contrast to other authors, we obtained slab related high velocity anomaly down to depths of 200-250 km and 500-600 km beneath western and eastern part of Aleutian arc, respectively. Slab shape beneath Sunda arc is also explained by mechanisms observed in IBM and Kuril-Kamchatka areas. One of the feature of this zone that is vertical clusters of earthquakes down to 150-200 km depth are observed beneath large caldera-forming volcanoes of this zone. Based on results for Taiwan we propose alternative scenario which explains the changing of penetration direction of the slab beneath southern Taiwan.