Thickness variation of the descending Philippine Sea slab beneath the Kanto-Tokai district, central Japan

Shin'ichiro Kamiya[1]; Youji Kobayashi[2]

[1] DONET, JAMSTEC; [2] Tsukuba Univ.

We use an iterative nonlinear travel time tomography technique to determine three-dimensional P-wave and S-wave seismic velocity models for the region beneath the Kanto-Tokai district of central Japan. Salient points of the models are the following: (1) The subducting Philippine Sea slab has thickness variation with a stepwise offset east of the Izu Peninsula. The eastern (beneath the Kanto district) and western (beneath the area north of Izu Peninsula and the Tokai district) regions have respective thicknesses of 60 and 25 km. The slab clearly subducts continuously to a depth of 100 km from the Sagami Trough beneath the Kanto district, although the Tokai slab is indistinct at depths of 50-70 km. (2) The oceanic crust at the top of the descending Philippine Sea slab transforms into eclogite at a depth of about 70 km beneath the Kanto district. (3) Low-velocity anomalies are associated with present and past volcanism. They are located on the west of a 110-km depth contour of the Wadati-Benioff zone, rather than only on the backarc side of the volcanic front. Deflection of the volcanic front might result from the subducting Philippine Sea slab, which shifts the dehydration reaction deeper as it subducts deeper.