

## High-Resolution Receiver Function Imaging of the Crust and the Uppermost Mantle Structure beneath the Whole Japan Islands

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We are executing array analyses of Receiver Functions (RFs) to map the seismic velocity discontinuities especially in the crust and the plate interface of the Philippine Sea Plate (PHS) under the Japan islands using J-array, F-net and new Hi-net data, whose stations are closely distributed (Hi-net:634, J-array:269, F-net:65).

For imaging of the crust and the uppermost mantle, SVD filtered (Chevrot and Giardin, 2000) RFs after transformation from time to depth domain are projected on to 2-D profiles, which show average values for cells within plus minus 25 km from each cross section. We set 11 profiles in southwest Japan, 11 one in northeast Japan, 5 ones in Hokkaido and 6 ones in Kyushu regions, respectively.

### Results and Discussions

We describe here the results in southwest Japan, where the stations are most closely distributed.

### The Moho

Generally, The Moho is distributed at the 25-40 km depth. The regions which have the deep Moho (35-40 km depth) correspond to those where the observed Bougure gravity anomaly (e.g. Hagiwara, 1967) is low.

In the Shikoku region, the Moho can be recognized only beneath the northern part, which is consistent with Ohkura (2000). The Moho is dipping northwards from the Shikoku region to the Chugoku region and has the bottom under the Chugoku Mountains. Then, it is getting shallower towards the Sea of Japan. In the Kinki region, the Moho is concaved beneath the inland area, too. Moreover, it is noted that the Moho is depressed beneath the Osaka Bay and there seems to exist a gap of 5 km in the Moho depth between the inland Kinki region and the Osaka Bay.

### The Dipping Philippine Sea Plate

The PHS subducts with a low dip angle of 10 degrees from beneath the Shikoku region to the Chugoku Mountains, which can be traced also by seismic activity. And then it suddenly changes its dip to 35 degrees just under the Chugoku Mountains, and subducts deep as an aseismic slab. Though recent tomographic studies (e.g. Yamane et al., 2000) have shown the same structure, our RF analyses provide far clearer image of the dipping interface of the PHS. The aseismic slabs is detected also beneath the Osaka Bay and the Lake Biwa to the 90 km depth and the 60 km depth, respectively.

We have newly found that the PHS swells by 5 km beneath the eastern Shikoku region and the southern tip of the eastern Chugoku region, which seems to be produced by the buoyant subduction of the light plate with low density Kinan Seamounts. This is because the Kinan Seamounts subducts beneath the region in the followings; (i) The protuberance is distributed in parallel with the dipping direction of the PHS. (ii) Hibbard and Karig (1990) suggest by geological data that the Shikoku basin spreading ridge subducted beneath the Muroto cape area in early Miocene. (iii) Kodaira et al. (2000) recognize a subducting seamount beneath the south-eastern side of the Muroto Cape