Japan Geoscience Union Meeting 2011
(May 22-27 2011 at Makuhari, Chiba, Japan)

SCG060-P14 Room:Convention Hall Time:May 25 16:15-18:45

Seismic Velocity Structure beneath Kii Peninsula

Taishi Fukui[1]*, Takuo Shibutani[1], Setsuro Nakao[1], Kazuhiro Nishimura[1], Masayo Sawada[1], Kazuro Hirahara[2]

[1]DPRI, Kyoto Univ., [2]Science, Kyoto Univ.

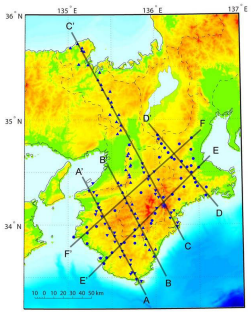
Philippine Sea Plate is subducting beneath the southwest Japan arc from the Nankai Trough. This causes megathrust earthquakes in the subduction zone. The latest events along the Nankai Trough are Showa Tonankai Earthquake (M7.9) in 1944 and Showa Nankai Earthquake (M8.0) in 1946. The next event is predicted to occur in 2030 - 2036 (Earthquake Research Committee, 2001). It is thought that the surrounding area of the southern edge of Kii Peninsula is most likely to be a rupture starting point of the megathrust events as it was in the Showa events. At the same time, the Kii Peninsula is a region through which hazardous seismic waves propagate from the megaquakes to large cities such as Osaka, Kyoto and Nara. The purpose of this study is to estimate structure of seismic velocity discontinuities, especially slab configurations beneath the Kii Peninsula. This is very important to upgrade the ways of predicting megaquake generations and strong motions caused by the events.

We have carried out linear array seismic observations in the Kii Peninsula since 2004. We deploy temporary seismic stations in the vicinity of profile lines with an average spacing of ˜5 km and a length greater than 80 km (Fig. 1). We obtain images of seismic velocity discontinuities beneath the Kii Peninsula by using a receiver function analysis with teleseismic waveforms, and estimate structure of the subducting slab and the surrounding regions in detail. We have completed the observations and analyses for three profiles in the subduction direction (Shiono Cape - Tajiri Line AA', Shingu - Kawachi-nagano Line BB', Owase - Kyotango Line CC') so far. As a result, the upper surface of the low velocity oceanic crust (the upper surface of the Philippine Sea slab), the oceanic Moho in the slab and the continental Moho in the arc side were clearly imaged. Furthermore, strong low velocity anomalies were found in the vicinity of the slab in the generating area of the deep low frequency events and widely in the mantle wedge.

We redeployed temporary stations along three profile lines in March 2009. One is Minami-ise - Shigaraki Line DD' in the subduction direction and the others are Matsuzaka - Shirahama Line EE' and Kameyama ? Gobo Line FF' in the perpendicular direction.

We estimated the depth contours for the continental Moho, the upper surface of the oceanic crust and the oceanic Moho by combining depth data of the discontinuities beneath the six survey lines picked up on the receiver function images.

In this presentation we will introduce the linear array seismic observation in the Kii Peninsula, the estimated features of the Philippine Sea slab configuration and the mantle wedge structure and the features of the contour maps of the three discontinuities.



figl. Seismic observation stations in the Kiipeninsula ▲,●.
Survey lines(AA',BB',CC',DD',EE',FF') are slid lines in the map.

Keywords: philippine Sea slab, Mantle wedge, Reciever function image, Linear array seismic observation, Kii Peninsula