



Complex geometry of the subducted Pacific slab inferred from receiver function

Ruiqing Zhang (1), Qingju Wu (1), and Guangcheng Zhang (2)

(1) China (zrq@cea-igp.ac.cn), (2) Shandong Institute of Earthquake Engineering, China (zhang02101227@163.com)

In recent years, slab tear has received considerable attention and been reported in many arc-arc junctures in Pacific plate subduction zones. From 2009 to 2011, we deployed two portable experiments equipped with CMG-3ESPC seismometers and the recorders of REFTEK-130B in NE China. The two linear seismic arrays were designed nearly parallel, and each of them containing about 60 seismic stations extended about 1200 km from west to east spanning all surface geological terrains of NE China. The south one was firstly set up and continually operated over two year, while the north deployment worked only about one year. By using the teleseismic data collected by these two arrays, we calculate the P receiver functions to map topographic variation of the upper mantle discontinuities. Our sampled region is located where the juncture between the subducting Kuril and Japan slabs reaches the 660-km discontinuity. Distinct variation of the 660-km discontinuity is mapped beneath the regions. A deeper-than-normal 660 km discontinuity is observed locally in the southeastern part of our sampled region. The depression of the 660 km discontinuity may be resulted from an oceanic lithospheric slab deflected in the mantle transition zone, in good agreement with the result of earlier tomographic and other seismic studies in this region. The northeastern portion of our sampled region, however, does not show clearly the deflection of the slab. The variation of the tomography of the 660-km discontinuity in our sampled regions may indicate a complex geometry of the subducted Pacific slab.