SSS034-P06   Room:Convention Hall   Time:May 23 10:30-13:00

Seismic structure under the Kanto Plain using receiver functions from deep borehole records

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At the High Sensitivity Seismograph Network (Hi-net, NIED) most stations in the Kanto Plain are located at bottom of the boreholes deeper than 1 km . Since the Kanto Plain is covered with very thick sediment layers, the deep borehole records observed in hard rock layers are useful for imaging the deep seismic structures. Takenaka and Murakoshi (2010, AGU) proposed a "receiver function" which is useful for deep borehole records to image the seismic structures below the stations. This method for deep borehole records is similar to an "S-wavevector receiver function" (SWV-RF) for ground surface records, introduced by Reading et al. (2003, GRL). The SWV-RF removes the free surface reflection phases and the first P-pulse and gives the complete representation of the converted waveform. The standard receiver function from deep borehole records is difficult to extract the P-to-S converted phases from seismic discontinuities because of the contribution of the free surface contaminating the P-to-S converted phases . The SWV-RF is relatively robust to the borehole structure model. The preliminary results of Takenaka and Murakoshi (2010, AGU) show that the SWV-RF from deep borehole records at Atsugi station removes the initial P-pulse and indicate P-to-S converted phases clearly. In this presentation, we will describe the estimated crustal structure by using the SWV-RF to the deep borehole records of the Hi-net in the Kanto Plain.

Keywords: receiver function, deep borehole, Kanto Plain, crustal structure, Philippine Sea slab