

Deep low-frequency seismic tremor in Southwest Japan

Kazushige Obara[1]

[1] NIED

Deep seismic tremors are discovered in non-volcanic region in southwest Japan by using NIED Hi-net data. The amplitude of the waveform of the seismic tremor is very small and it is very difficult to distinguish the P and S wave. Because the normal hypocentral determination method is not applicable, we develop a method to determine the source location of the tremor by using correlation analysis for the RMS envelope seismogram. Epicenters of tremors are distributed along the strike of the subducting Philippine Sea plate with length of 600 km from Tokai, central Japan to Bungo channel, between Kyushu and Shikoku Island. The tremors occur at the depth of about 30km, near the Moho boundary just above the subducting slab. Time sequences of the tremor activity are characterized by active and quiet periods with no periodicity. The active period generally continues for several days, sometimes weeks. The tremor sometimes becomes very active just after the occurrence of a nearby relatively large event. Location of the tremor moves horizontally in hundreds of kilometers with a velocity of 9-13km/day. The sequential occurrence and mobility of the source location suggests that the tremor may be related to fluid. The restricted focal depth and the consistence of the horizontal location with the subduction zone indicates that the tremors may be caused at a special condition of temperature and pressure with rich fluid generated by dehydration process from the slab.