Crustal uplift in the western Shizuoka Prefecture associated with the 1944 Tonankai earthquake and a splay fault model

Takeshi Sagiya[1]

[1] Environmental Studies, Nagoya Univ.

Yamanaka (2004, 2006) pointed out a possibility that the source region of the 1944 Tonankai earthquake reached to Omaezaki based on a re-analysis of waveform data. The new model can explain both seismological and tsunami data. However, the new model fails in reproducing vertical displacement profile in the western Shizuoka Prefecture, where an uplift of about 20cm was observed. Since the uplift was detected from two leveling surveys in 1931 and 1950, the data might be contaminated non-coseismic deformation during 20 years before and after the earthquake. But another leveling route from Mori to Omaezaki via Kakegawa was surveyed twice within 1 month of the main shock and an uplift of about 10cm was detected around Kakegawa. So the significant uplift accompanied the Tonankai main shock. I inverted this vertical displacement data and obtained a reverse fault model, whose upper limit depth and dip angle are 13km and 35 degree, respectively. The estimated fault plane roughly coincides with the crustal reflector detected from the seismological exploration in 2001, and crustal seismic activity occurs nearby. A fault plane associated with such crustal heterogeneity might be activated during the main rupture of the 1944 Tonankai earthquake. Based on these considerations, a possibility of plate boundary rupture east of Lake Hamana during the 1944 rupture is excluded and, in turn, I propose a possibility that a splay fault branched from the megathrust was activated. This splay fault might be responsible for a precursory tilt change of the 1944 Tonankai earthquake. But it is difficult to explain the causal relationship between a precursory slip of the splay fault and the main shock on the plate boundary megathrust.