Japan Geoscience Union Meeting 2015
(May 24th - 28th at Makuhari, Chiba, Japan)

SSS31-08 Room:304 Time:May 25 16:15-16:30

Characteristics of viscoelastic relaxation caused by the 2011 off the Pacific coast of Tohoku earthquake

SUITO, Hisashi[1*]

[1]GSI of Japan

We are developing a 3-D viscoelastic model using the Finite Element Method to describe the postseismic deformation following the 2011 Tohoku-oki earthquake. A purpose of this presentation is to describe the characteristic of the viscoelastic relaxation. Our model is composed of an elastic crust and subducting plate, plus a linear (Maxwell) viscoelastic upper mantle wedge and mantle beneath the slab (oceanic mantle). The viscoelastic relaxation strongly depends on the viscosity of the upper mantle. The viscoelastic relaxation at oceanic mantle produces westward displacements and subsidence. On the other hand, the viscoelastic relaxation at mantle wedge produces eastward displacements and uplift. Therefore, observed westward displacement and subsidence at sea area are probably produced by the viscoelastic relaxation at oceanic mantle, and eastward displacement at the land area and uplift at the Pacific side are produced by the viscoelastic relaxation at mantle wedge. If the viscosity of the oceanic mantle is smaller than that of the mantle wedge, westward displacement and subsidence are dominant. On the other hand, if the viscosity of the oceanic mantle is larger than that of the mantle wedge, eastward displacement and uplift are dominant. Hence, the ratio of the viscosity between mantle wedge and oceanic mantle is important to quantitatively explain the observed displacements.

Keywords: Tohoku-oki Earthquake, Postseismic deformation, Viscoelastic relaxation