Japan Geoscience Union Meeting 2012
(May 20-25 2012 at Makuhari, Chiba, Japan)

SCG72-P03 Room:Convention Hall Time:May 22 17:15-18:30

Lower crustal heterogeneity beneath the northeast Japan

ISHIKAWA, Masahiro[1*]

[1]Yokohama National University

Numerous crustal earthquakes occurred beneath the northeast Honshu arc after the 2011 Tohoku-Oki M9 earthquake. However, crustal earthquakes following the 2011 Tohoku-Oki M9 earthquake is not homogeneously distributed throughout the northeast Honshu arc. For example, seismicity rate increase around Iwaki after the 2011 Tohoku-Oki M9 earthquake, and the 11 April 2011 Mj=7.0 Iwaki earthquake, which is one of the biggest crustal earthquakes, produced over 10km of normal faulting along Shionodaira fault in the Gosaisho metamorphic rocks (the eastern half of the Abukuma metamorphic belt).

Because mineral chemistry and rock composition are important factors to control rheological strength of the arc crust, inhomogeneous distribution of the crustal earthquakes is expected to reflect deep crustal inhomogeneity, Our previous study of petrological crustal structure model of the northeast Honshu arc showed that; (1) the high-Vp and Vs regions beneath the Tobishima Basin consist of hornblende-pyroxene gabbro, (2) hornblende gabbro is a predominant rock type beneath the Dewa Hillsand Ou Backbone Range, (3) the low-velocity anomalies beneath the active volcano areas may be caused by the existence of partial melts of hornblende gabbro, and (4) the low-Vp and high-Vs regions beneath the Kitakami Mountains consist of quartz plagioclase-bearing rocks. The study demonstrated that the heterogeneity of seismic velocity in the lower crust of the northeast Japan arc reflects variations in rock composition and temperature that are related to the regional geological history. However this model doesn’t include a key geological event ”Cretaceous left-lateral shearing”. In order to evaluate the postseismic crustal deformation around Iwaki, we have to take into account the Cretaceous left-lateral shearing in crust and mantle of the NE japan.

Keywords: crust, island arc, Tohoku, seismic velocity, elastic wave velocity