SSS33-P01   Room:Poster   Time:April 30 18:15-19:30

Post-seismic crustal movements of the 11 April Mw6.6 Fukushima Hamadori earthquake based on GPS observations

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Tohoku earthquake on March 11, 2011 (Mw9.0) was accompanied by a vigorous aftershock activity. One of the aftershocks occurred on April 11, 2011, nearby Iwaki city, Fukushima Prefecture, and was called as Fukushima-Hamadori earthquake (Mw6.6; Depth=5km). The focal mechanism of the earthquake was a normal fault. Co-seismic crustal movements due to the earthquake observed by GPS observation was amounted to about 30cm to northeast direction at Iwaki site.

Crustal deformations associated with the Fukushima-Hamadori earthquake is obtained by InSAR and the data were used to construct detailed fault slip models by the previous studies (Kobayashi et al.,2013 : Fukushima et al.,2013). However, it has not been possible to measure the postseismic deformations using the SAR because the ALOS satellite has terminated its operation in immediately after the Fukushima-Hamadori earthquake. Thus, the postseismic crustal movements has been observed only by the GPS observations. Therefore, we aim to elucidate the mechanism of postseismic deformations due to the Fukushima-Hamadori earthquake using the GPS data in this study.

In this study, it was assumed that postseismic crustal deformations were caused by a slip in the vicinity of the fault. We used earthquake fault geometries employed by previous studies (Kobayashi et al.,2013 : Fukushima et al.,2013). As the GPS data is including large postseismic displacements due to the main shock since the March 11, first, we removed the postseismic transient displacements from GPS data using a postseismic slip model of the main shock (Fukuda et al., 2013). The obtained residual displacements after April 11, 2011, are considered as postseismic displacements due to the Fukushima-Hamadori earthquake. We, then, estimated slip distribution on the fault plane based on the residual displacement field. We will discuss estimated results in our presentation.