

Crustal deformation and fault model of the 2018 Hokkaido Eastern Iburi earthquake

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An inland earthquake with a moment magnitude of 6.6 occurred in the eastern Iburi subprefecture in Hokkaido, Japan on September 5, 2018. Significant coseismic deformation associated with the seismic event was observed at GNSS Earth Observation Network (GEONET) stations which were operated by the Geospatial Information Authority of Japan. The sites “950141” and “950136 which are ~20 to ~30 km distant from the epicenter moved southward with ~5 cm and eastward with ~4cm, respectively. In addition to GNSS observation, we applied an interferometric SAR (InSAR) analysis using ALOS-2 SAR satellite data to the earthquake, and detected the crustal deformation. From the InSAR analyses, we can find that the observed phase changes show slant-range shortening in the epicentral area in both the results from ascending and descending orbit paths with right-looking mode. It strongly suggests that the ground uplift is predominant in the source region. We constructed the fault model that assumes a rectangular fault with a uniform slip, using SAR- and GNSS-derived crustal deformation data. The estimated rectangular fault model with a uniform slip shows a high-angle reverse fault motion with the strike of north–south direction. The upper edge of the fault is at a depth of ~15 km. The depth is significant shallower than the hypocenter (37 km) and the spatial distribution of aftershocks. The seismic moment is estimated to be 8.59×10^{27} Nm ($M_w=6.56$), which is consistent with the analysis result of seismic wave.

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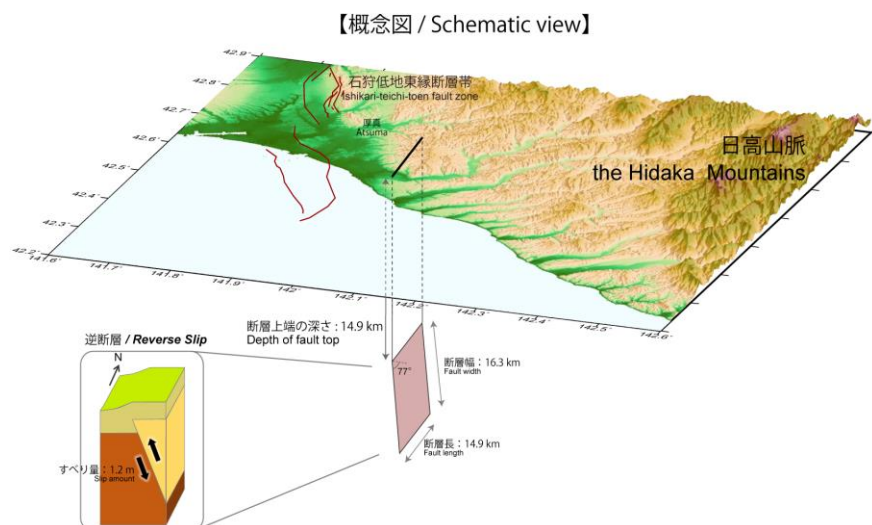


Fig. 1. Schematic view of estimated fault model for the 2018 Hokkaido Eastern Iburi earthquake.