



Characteristics of the 2024 Noto Earthquake and Tsunami occurred in the Eastern Margin of the Japan Sea

Yuichiro Tanioka and Yusuke Yamanaka

Institute of Seismology and Volcanology, Faculty of Science, Hokkaido University, N10W8, Kita-ku, Sapporo, Hokkaido, 060-0810, Japan

On January 1, 2024, a large earthquake (Mw7.6) occurred along the northern coast of the Noto Peninsula, Japan. Because the faults of the earthquakes were located beneath both land and sea, the large strong motion and tsunami were generated and caused severe disasters near the source area. More than 200 people were killed by the earthquake.

The earthquake occurred on the Eastern Margin of the Japan Sea where several great earthquakes and tsunamis occurred previously such as the 1993 Hokkaido Nansei-oki earthquake (Mw7.8), the 1983 Japan Sea earthquake (Mw7.7), and the 1964 Niigata earthquake (Mw7.6). The 2024 Noto earthquake also occurred on the same Eastern Margin of the Japan Sea where a large number of submarine active faults were identified by the undersea structure surveys and also the GNSS surveys indicated a convergence rate of approximately 1cm/year along the margin.

The aftershock activity and the seismological analysis by the Japan Meteorological Agency (JMA) and the co-seismic deformation analysis using GNSS data by the Geospatial Information Authority of Japan (GSI) of the 2024 Noto earthquake showed that the fault length is about 150 km. Particularly, a northeast part of the fault was extended to the Japan Sea where the Noto peninsula was terminated. The co-seismic deformation due to the faulting generated a large tsunami observed at several tide gauges along the Japan Sea coast.