Outline of the Noto Hanto Earthquake in 2007

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M6.9 earthquake occurred off the coast of Noto peninsula at the depth of 11km at 9:45am (JST), March 25, 2007. Strong ground motions were observed at around Noto region, e.g., seismic intensity of '6-upper' on the Japan Meteorological Agency (JMA) scale at Nanao-shi, Wajima-shi and Anamizu-machi, and '6-lower' at Shika-machi, Nakanoto-machi and Noto-cho in Ishikawa prefecture. One person was killed, 327 persons were injured, 540 houses were completely and 826 houses were partially destroyed by the earthquake (as of April 10, Fire and Disaster Management Agency). JMA named this earthquake as 'the Noto Hanto Earthquake in 2007'.

Earthquake Early Warning (EEW) was disseminated from JMA, in which it is described that 'Seismic intensity of '5-lower' or larger is expected at Noto region'. First warning was issued in 3.6 seconds after the first detection of seismic waves. Though the warning was after large amplitude S wave arrival at the regions where seismic intensity of '6-upper' was observed, it was earlier by 5 seconds than the S wave arrival at Noto-machi, 7 seconds at Suzu-shi where seismic intensity of '5-upper' was observed, and 12 seconds at Toyama-shi where '5 lower' was observed. Using the EEW technique, JMA could issue Tsunami advisory in 1min. 37 seconds after the detection of seismic waves.

Two largest aftershocks of M5.3 occurred at 6:11pm, March, 25, at the north-east edge of aftershock activity region, and at 7:16am, March, 26, at the west edge, respectively. The aftershock activity is more active than that of Western Tottori Pref. earthquake in 2000 (M7.3), and less than that of Mid-Niigata earthquake in 2004 (M6.8), the Southern Hyogo prefecture earthquake in 1995 (M7.3), and Fukui earthquake in 1948 (M7.1), in which the numbers of aftershocks of M4.0 or larger are compared. Aftershocks are distributed over the length of approximately 40km in north-east to south-west direction, and the width of 10km in north-west to south-east direction. Focal depth is about several km at the north-west portion, and about 10 km at the south-east of the aftershock region. There are two gaps of aftershock distribution between the mainshock and the two largest aftershocks, which may form the boundaries of different directions of the aftershock distribution. Analysis of delta CFF indicates that the two largest aftershocks occurred at the place where stress is accumulated by the mainshock.

Focal mechanism of the mainshock is the type having P-axis of ESE-WNW, which is consistent with the typical type previously observed as the axis of E-W or SE-NW. The focal mechanism of the mainshock takes a middle position between strike slip fault type and reverse fault type: strike slip fault type is dominant according to the analysis of P wave polarity, and reverse fault type is dominant according to CMT. Mechanisms of most aftershocks are also strike slip fault type or reverse fault type having P-axis of E-W or SE-NW. Rupture process was analyzed based on the assumption of fault plane having declination to SE, and the result indicates that the rupture process is simple.

Earthquakes of M6.0 or larger have occasionally occurred around Noto region last 80 years: M6.0 occurred in 1933 near Nanao-shi, M6.6 in 1993 off the NE coast of Noto peninsula, M6.2 in 2000 off the west coast of Ishikawa prefecture. The number of small earthquakes increased a little bit around this region from several years ago. M2.0 earthquake occurred 12 min. before the mainshock.

The mainshock caused tsunami. At Nagahashi, Suzu-shi, first wave was observed at 10:15am, and the maximum amplitude of 22cm at 11:13pm; and at Kanazawa, the first wave was observed at 10:21am, and the maximum amplitude of 18cm at 12:21pm.