

Re-examination of large 20th century earthquakes along the southern Japan trench -The 1927 and 1953 off Boso earthquakes

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We re-examine hypocenters, focal mechanisms and fault models for large earthquakes off Boso region along the southern Japan Trench. The relocated epicenter of the 1927 Boso earthquake, from newly collected S and S-P times, is about 100 km to the west of that of Japan Meteorological Agency (JMA).

Off Boso, several large earthquakes (e.g., the 1953 Boso earthquake) and tsunami earthquakes (e.g., the 1677 Empo earthquake) have occurred, but their recurrence periods are not well known. Two earthquakes, one on August 18, 1927 with M_{jma} 6.4 and M_t 7.4, and the other on November 25, 1953 with M_{jma} 7.4 and M_t 7.8, have different epicenters and tsunami source areas. While the 1927 epicenter was located southeast of the 1953 epicenter, the 1927 tsunami source was estimated northwest of the 1953 tsunami source (Hatori, 1975). We identified the locations of tide gauge stations in 1920's, and recalculated the tsunami travel time. The tsunami source area was located a little southwest of that of Hatori (1975). To relocate epicenter, we collected seismic waveforms and original arrival time reports from the local meteorological observatories of the 1927 earthquake, and re-examined those S-P times. At some observatories, the value reported as a preliminary tremor in 1927 was not S-P but L-P time. Even if there were no report from a local meteorological observatory, there were some observatories where seismic waveform records remain, and P and S wave arrival times were written on them. Re-examined S-P time distribution of the 1927 earthquake looks similar to that of the 1953 earthquake. The 1927 epicenter is estimated at 141.2-141.7E and 34.1-34.2N, while that of JMA (2004) is 142.4E and 33.8N. The 1953 epicenter by JMA is 141.4E, 34.2N.

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