

## Great interplate earthquakes along the central Kurile subduction zone

# Yuichiro Tanioka[1]; Kei Ioki[2]

[1] Hokkaido U; [2] ISV, Hokkaido U

Several great interplate earthquakes occurred along the Kurile trench due to subduction of the Pacific plate beneath the Kurile Islands, and large tsunamis have been generated by those earthquakes. Recently, the great Kurile interplate earthquake (Mw8.3) occurred off Simushir Island along the central Kurile subduction zone on November 15, 2006. Previous great interplate earthquake along the central Kurile region is the 1963 Kurile earthquake (Mw 8.3) which occurred off Urup Island. The tsunami waveform analysis of the 1963 earthquake (Ioki and Tanioka, in this meeting) indicates that the fault length is about 200km and the large slip was found in the northeast of the source area. In this central Kurile region, the 1918 great Kurile earthquake (Mw 8.2) also occurred and generated large tsunami. Previous study indicated that the source area of the 1918 earthquake should be located northward from the source area of the 1963 Kurile earthquake. However, the distance between the rupture areas of the 2006 and 1963 Kurile earthquake is less than 70 km which may be too short to have another great earthquake between the two great earthquakes. A key question is where is the source area of the 1918 Kurile earthquake? In this paper, we try to find the source area of the 1918 great Kurile earthquakes using the tsunami waveforms observed at tide gauges along the Pacific coast.

The tsunami waveforms for the 1918 earthquake were observed at two tide gauges in Japan, Choshi, and Chichijima (Nakamura, 1919). The tsunami was also observed at tide gauges in Honolulu, and in San Francisco. Those tsunami waveform data in USA were collected from NOAA-NGDC. At first, all of those observed tsunami waveforms showed positive first waves. It means that the earthquake was not a normal fault event along the outer rise such as the 2007 Kurile earthquake and it should be an interplate earthquake. We numerically computed tsunami using various fault models located at different plate interfaces along the central Kurile subduction zone. The observed tsunami waveforms at four tide gauges were compared with computed ones to find the best fault model. There may be large errors on time scales at the tide gauge records in 1918. It was difficult to decide the best fault model with large errors on timing. If we assumed that the errors on time scale is less than 20 minutes, we found that the source area of the 1918 Kurile earthquake was closer to the source area of the 2006 Kurile earthquake than that of the 1963 Kurile earthquake. It suggests that the 2006 Kurile earthquake was a recurrence event of the 1918 Kurile earthquake. The total seismic moment of the 1918 Kurile earthquake was  $4.0 \times 10^{21}$  Nm (Mw8.4) by assuming the rigidity of  $4 \times 10^{10}$  N/m<sup>2</sup>.