Fault Slip Distribution along Kuril Trench estimated by Automated Source Process Analysis with Teleseismic Body-Waves based on Scaling Relationships of Fault Slip Distribution

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1. Introduction
We have examined optimized preset parameters for automatic source process analysis with teleseismic body-waves. We set parameters mainly based on scaling relationships derived from fault slip distribution studies, and we confirmed that we could set all parameters for automatic source process analysis based on hypocenter and focal mechanism data. Then, we compared fault slip distribution analyzed by our automated source process analysis with USGS' s analysis for some large earthquakes, we confirmed that there was a good correlation between them. This time, we set source fault model more optimally based on event magnitude, and examined fault slip distribution of earthquakes along Kuril Trench by automated source process analysis.
2. Analysis Methods
We used the same program package as Iwakiri et al. [2014] for analyzing source process with teleseismic body-wave. This program package is modification of the program package by Kikuchi and Kanamori [2003]. We used broadband waveform data which were downloaded from IRIS DMC HP. We used hypocenter and focal mechanism data of W-phase moment tensor of USGS. Hypocenter was assumed as the center of fault plane, and subfault size was set based on event magnitude. Source-time function was set as triangle functions, and rise time was set based on event magnitude. And other parameters were set based on scaling relationships or experience.
3. Results
In the case of earthquakes near Etorofu Island in December 1991 (Mw7.6), in December 1995 (Mw7.9) and in February 1996 (Mw7.2), the fault slip areas estimated by automatic source process analysis were found not to have overlapped each other (Fig. 1). These area are covered with the rupture area of the event in October 1963 very well. It is considered that the strain accumulated after the 1963 event have been released by the three event from 1991 to 1996. In the case of earthquakes in December 1991 and December 1995, there were active foreshocks near the hypocenter, and they were distributed in a complementary way with large-slip areas. In the case of the Tokachi−oki Earthquake in September 2003 (Mw8.3), there was seismic gap before the main shock and the seismic gap was located in the area of large-coseismic-slip area.
Acknowledgement
We used the broadband waveform data provided by IRIS, IASP91 model, source parameters estimated by USGS, and CRUST2.0 model.

Keywords: Source Process, Kuril Trench, Scaling Relationships

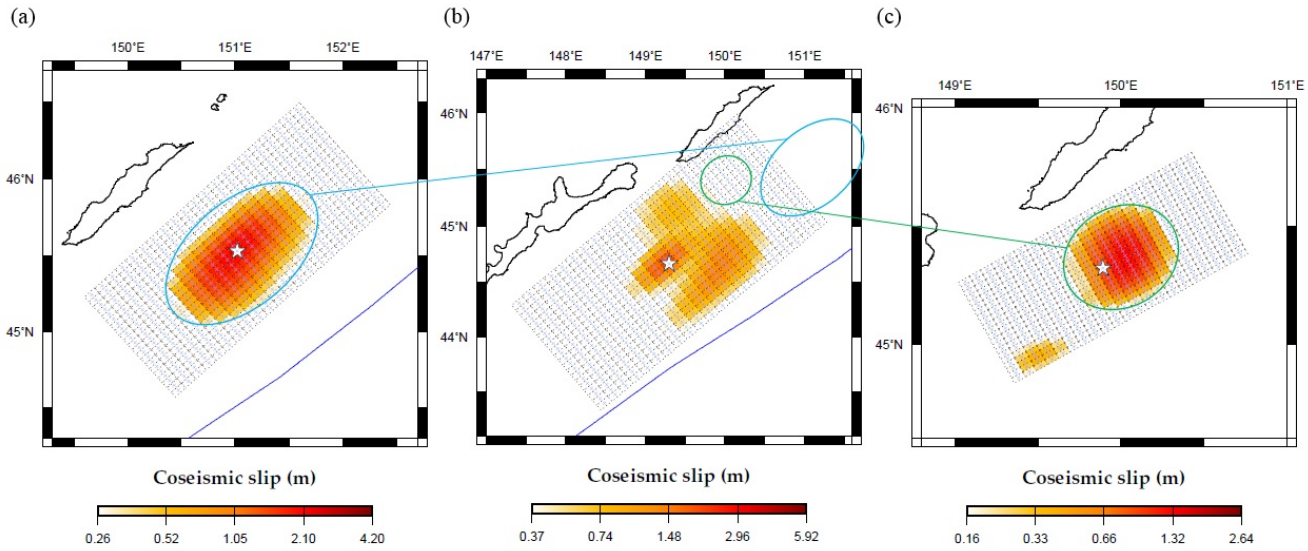

Fig. 1 Source process analysis results using automated source process analysis with teleseismic body-waves based on scaling relationships derived from fault slip distributions. (a) the December 1991 (Mw7.6), (b) the December 1995 (Mw7.9), (c) the February 1996 (Mw 7.2).

