

Rupture process of the 2006 and 2007 great earthquakes along the Kuril trench as inferred from surface waves

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Two great earthquakes occurred along the Kuril trench on Nov. 15, 2006 and Jan. 13, 2007. The former event is a thrust event resulting from subduction of the Pacific Plate beneath the North American Plate while the latter is an outer-rise event. We analyzed the surface waves from these two earthquakes in order to infer the gross features of the two earthquakes. The surface waves analyzed in this study were recorded with broad-band seismograms, and were collected by IRIS DMC. First, we estimated ratio of seismic moment of the two events, taking ratio of Fourier spectrum observed at the same stations. We found that the seismic moment of the November event is about twice as large as that of the January event. This result agrees with that derived from analysis of tsunami (Fujii and Satake, this meeting). We then investigated the characteristics of the individual events. We inferred rupture duration from trios of surface wave trains (Furumoto and Nakanishi, 1983, JGR). The duration was estimated to be over 100 s but less than 150 s for both events. These durations are not anomalously long when comparing with empirical relationship derived by Furumoto and Nakanishi (1983). Finally, rupture direction of both events was inferred with comparing the amplitude of R1 with that of R2. For both events, the amplitude ratio observed at a station to SSW of the epicenter was found to be smaller than those observed at other stations. This variation shows that rupture propagated to the opposite direction of the station with the smallest ratio, that is, NNE from the epicenter. This direction agrees with the aftershock distribution.

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