

Source rupture process of the 26 May 2003 Miyagi-oki earthquake

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The detailed and stable rupture process of 26 May 2003 Miyagiken-oki earthquake is examined using both near-field strong motion data and teleseismic body wave data. The derived source parameters are as follows: (strike, dip, slip) = (190.0, 69.0, 96.4); the seismic moment, $M_0 = 3.75 \times 10^{20}$ Nm ($M_w = 7.0$); the source duration = 12 sec; the along-strike distance = 25 km; the along-dip distance = 15 km. We found the rupture unilaterally propagates to northward from the hypocenter, and the rupture process is divided into two episodes. First, the rupture spread around the hypocenter and broke the first asperity (large slip area). Secondly, the rupture propagated towards north for 15 km from hypocenter and broke the second asperity. The maximum dislocation occurred at the first asperity with scale of 1.9 m.

Comparing the slip area with one-month distribution aftershocks, we found that the aftershocks occurred in the deep side of the co-seismic slip area and large slip area (slip larger than 1.0 m) do not overlap with the aftershock distribution. This implies that the stress field near plate boundary has changed because of this event.