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*Foreshock and Aftershock Sequence of 1998 M5.0 Earthquake
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An earthquake with M5.0 occurred in Sendai city, northeastern Japan, on 15 September, 1998. Its focal mechanism is a reverse fault-type with nearly horizontal P-axis parallel to the plate conversion direction. Aftershocks distribution located by the homogeneous station method delineates the fault plane of this event. It dips to the northwest at an angle of 30° in the depth range of 10–12 km, which suggests a slip at the deep portion of Nagamachi-Rifu fault. Three days prior to the main shock, many foreshocks with similar waveforms took place very close to the main shock hypocenter. We located relative locations of those similar foreshocks by cross spectrum method. They are located at the deepest portion of the main shock fault plane and just above the main shock hypocenter. Migration of the foreshocks is observed from deeper to shallower depths. Slow initial phase prior to the high-speed rupture of the main shock is observed. The location of the slow initial phase is estimated at the deepest portion of the foreshock area. The high-speed breakout point is located at the area where a large amount of fault slip was estimated from waveform inversion (Okada *et al.*, 1999). Distinctive reflected SxS and PxP phases were observed in seismograms of aftershocks at many stations. We determined locations of reflectors (bright spot) by using arrival times of these phases. A clear reflector is located in the depth range of 15 to 21 km just beneath the fault plane. It dips toward the NNE direction with a dip angle of about 25° . Other reflectors are also located beneath the fault plane of the M5.0 event. Observed SxS phases have anomalously large amplitudes, suggesting that the reflector bodies are filled with fluids. Their close locations to the M5.0 event suggest the effect on the occurrence of the main shock rupture.