

Imaging of rupture at beginning stage of the 2009 Suruga-bay earthquake

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The 2009 Suruga Bay, Japan, earthquake (Mw6.3) occurred at 5:07 a.m. on August 11, 2009 (JST; JST=UT+9h) at the eastern tip of the Supposed Tokai earthquake source area, which is an intraslab earthquake (the largest seismic intensity observed 6-, JMA). In this earthquake it was pointed out that the dislocation may have occurred on two fault planes (SE-dipping and NE-dipping planes): the rupture started on the SE-dipping plane and was then transferred to the NE-dipping plane (e.g., Suzuki et al., 2009, SSJ Fall Meeting) In this paper, investigating the initial stage of the rupture, we analyze the P-wave portion before the S-wave arrival of the waveform records at local strong-motion stations relatively near the source area to investigate the rupture process during about 3.5 seconds after the rupture initiation. We scanned the source region during this initial rupture stage by using a source imaging technique (Takenaka et al., 2009) for mapping the wave energy onto horizontal planes at sequential depth and time intervals, where the employed hypocenter coordinates were determined from the Japan Meteorological Agency and (JMA) and the used velocity structural model is the JMA2001 (Ueno et al., 2001). From this imaging, we found that at above 2 s after rupture initiation the rupture was transferred to the second fault plane (i.e., NE-dipping plane) at a level of about 2 km above the hypocenter. In the presentation we will focus on this rupture transfer by improving the resolution using more near-source records. Acknowledgments: We used the strong-motion records supplied by the National Institute for Earth Science and Disaster Prevention (K-NET, KiK-net, F-net).

References:

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