

Imaging of asperities from P-wave records: Application to the 2007 Noto Peninsula earthquake

Yosuke Yamamoto[1]; # Hiroshi Takenaka[2]

[1] G.R.I.; [2] Dept. Earth & Planet. Sci., Kyushu Univ.

Recently we developed a method for imaging asperities from P-wave records observed relatively in near-source region, and successfully applied this source imaging method to near-source strong-motion records of the 2005 West Off Fukuoka Prefecture earthquake (Mj 7.0; Mw6.6) (Yamamoto, Takenaka, Uehira, 2006; Takenaka and Yamamoto, 2006; Yamamoto and Takenaka, 2006) to get a spatially high-resolution image of the asperity, from which strong seismic wave energy was radiated.

Here we applied this method to the 2007 Noto Peninsula earthquake (Mj6.9) which occurred at 9:41 on 25 March, 2007 (JST=UT+9hrs) to image the asperities of this earthquake. We used the UD-components of P-wave portion of velocity records at 13 stations whose epicentral distance ranges from 10 to 50 km. We applied a high-pass filter to all records to eliminate the near-field term which is predominant in vicinity of the focal area. We employed the hypocenter determined by the JMA as the rupture initiation point and assumed the fault plane with strike of N58E and dip angle of 66 degrees by referring the F-net CMT solution by NIED. Although the azimuthal coverage and density of stations are not so good as the case of the 2005 West Off Fukuoka Prefecture earthquake, we could get relatively clear image of the asperity for this earthquake. In our imaging results the asperity distributes along a updip and strike direction from the hypocenter and the imaging peak locates around the coast near Monzen-cho, Wajima city in the Noto Peninsula. It is consistent with damage distribution and slip inversion results estimated by other organizations.

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