

## Imaging of the initial rupture in the 2005 West Off Fukuoka Prefecture earthquake

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In the March 20, 2005 West Off Fukuoka Prefecture earthquake (Mj 7.0), clear initial rupture phase was observed before arriving the main rupture phase. In this study, we use 28 strong-motion records (Fukuoka Prefecture, JMA, K-NET, KiK-net, and Kyushu University) and obtain the relative location of the main rupture starting point with respect to the initial hypocenter. The main rupture starting point is estimated to be 5.1 km from the hypocenter to the direction of 127 degrees, and the starting time of the main rupture is 3.7 seconds after the origin time. We determine the focal mechanism solutions, the strike of the initial rupture plane from the focal mechanism solution is 296 degrees, and strike of the main rupture plane is 304 degrees. It indicates the initial plane and the main rupture plane are different even if the error margin is considered because there is a difference of strike by 8 degrees.

Further we use 16 strong-motion records and stack to examine details of the initial rupture considering the rupture shift from initial rupture plane to main rupture plane. In this study, we used the Nth root stack. As a result, it was found that rupture first moved toward the direction of strike of initial rupture plane for about one second and changed to the main rupture plane. The rupture advanced toward the direction of Fukuoka City along the main rupture plane. In addition, it is confirmed that the seismic energy release started to increase to 2.7 seconds after the beginning of initial rupture.

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