

Strong-motion distribution of the 2005 Northwest off Fukuoka earthquake, recorded over Fukuoka area

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The 2005 northwest off Fukuoka earthquake ($M_{jma}=7.0$) occurred on 20 March 2005 (local time = UT + 9 hours) at 30 km from the Fukuoka city coast, which shacked strongly Fukuoka city and surrounded area. Aftershock distribution (SEVO, Kyushu Univ.) shows a northwest-southeast trend with about 30 km length. The southeast edge of the earthquake fault approached Shikanoshima Island (GSJ). During the mainshock in some part of Fukuoka city the JMA seismic intensity of 6- has been observed and many building damages were reported.

This earthquake is the first M7-class earthquake since dense strong-motion observation networks were developed over Japan after the 1995 Kobe earthquake. In Fukuoka prefecture area, many strong-motion stations more than 100 have been developed by the Fukuoka prefecture, the NIED, the JMA and Kyushu Univ. We collected the waveform data of the mainshock from about 100 stations. Furthermore, for some of the observation stations we have precisely measured the azimuth of seismometers with the Fiber Optic Gyro.

In this presentation we analyze these strong-motion records to derive the spatial distribution of various parameters of ground motion (acceleration, velocity, and displacement) in different frequency bands, shacked direction and duration. Several characteristic features from strike-slip faulting of a vertical fault such as stronger motion of the fault-normal component than the fault-parallel one, and some structural and local site effects can be seen. The results of this study are all measured fact, and we believe that they have significant importance in hazard estimation for large urban earthquakes.