

# Dynamic rupture process of the 2004 Mid Niigata prefecture earthquake

# Takeshi Kimura[1]; Takashi Miyatake[1]; Kazuhito Hikima[2]; Takumi Yasuda[3]; Kazuki Koketsu[4]

[1] ERI, Univ. of Tokyo; [2] Oyo Corporation & ERI ; [3] ERI, Tokyo Univ; [4] Earthq. Res. Inst., Univ. Tokyo

## 1. Introduction

The Mid Niigata prefecture earthquake (MJMA 6.8) occurred at 17:56 on 23 October 2004 (JST). One of the notable features of this event is that, for an M6 class event, unusually strong ground motions were observed near the source region. The effect of rupture process of this event is considered as one of the main reasons of such strong motions. In this study, we construct the dynamic rupture process of the mainshock.

## 2. Dynamic rupture process of the 2004 Mid Niigata prefecture earthquake

In this study, we construct the dynamic rupture model of the 2004 Mid Niigata prefecture earthquake by the method developed by Miyatake (1992). The kinematic rupture model of this event is estimated from waveform inversion (Hikima and Koketsu, 2005). We construct the dynamic rupture model based on their kinematic rupture model method. First, we calculate the static stress drop distribution on each subfault from the slip distribution of the kinematic rupture model. Then, we assume the static stress drop distribution and the rupture start time distribution, which are obtained by the interpolation of the result of the kinematic rupture model as the boundary condition of the fault plane, and use the finite difference method to the 3-D equation of motion. We assume the slip-weakening model as a friction law on the fault plane. The dynamic rupture model constructed by this study corresponds to the kinematic model estimated by Hikima and Koketsu (2005). However, especially around the rupture nucleation point, the dynamic parameters might not be estimated accurately, since the rupture has occurred before the peak stress builds up to enough value. We must improve this problem to estimate more accurate dynamic parameters. We will compare the calculated waveforms with observed waveform. And we take the heterogeneous structure model around the source area into account to investigate its effects on the rupture process of this event..