

Physical Meaning of the Rapid Growth of Shaking Intensity Magnitude

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We proposed shaking intensity magnitude (M_i) to estimate shaking intensity for EEW and found that it grows rapidly to the final value in an early stage of rupture [Horiuchi and Yamamoto, 2005]. So as to understand the physical meaning of this observation, we estimated the times when M_i becomes nearly constant by making a model using empirical results obtained by Sommerville et al. (1999), who presented relations between M_0 and the size of asperity and between M_0 and the distance from hypocenter to the largest asperity. We assume in the model that M_i becomes the final value when the first asperity is ruptured. We compared the growth times estimated from the model with observed growth times and found that the estimated values almost agree with observed ones. This indicates that M_i is mainly controlled by the first asperity and we can estimate correct shaking intensity before entire rupture process finishes by using M_i in an EEW system.