

## Seismic Intensity Estimation Taking into Account Fault Finiteness for Earthquake Early Warning

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Estimation of seismic intensity is one of the most important topics for earthquake early warning. For this purpose we have developed seismic intensity magnitude (MI) which can estimate seismic intensity more accurately and rapidly than the conventional magnitude. This parameter can make it possible to decrease estimation error by about 20%. However, it is clear that fault finiteness should be considered to estimate proper distribution of near-field intensity for very large earthquakes. For this case, location of asperity is more important than hypocenter. In this study we develop a robust method to estimate intensity taking into account fault finiteness by using 'centroid of intensity' ( $X_{opt}$ ) which is determined from distribution of observed intensity. A flow of this method is as follows; 1)determine hypocenter and MI, 2)set candidates of  $X_{opt}$  on the grid around hypocenter. Location of candidates is restricted by assumed rupture velocity and rupturing time, 3)calculate average errors of estimated intensity by using MI for each candidate, 4)select optimum  $X_{opt}$  and  $MI_{opt}$  which give minimum estimation error, 5)use  $X_{opt}$  and  $MI_{opt}$  to estimate intensity at a target site, 6)repeat the those procedures when observation data are updated. We applied this method to the 2003 Off Tokachi earthquake and found that estimation error gets smaller by 21-35% than the conventional method using hypocenter.