

Difference in seismic source characteristics between surface and buried fault rupture of crustal earthquake in Japan

*Shohei Yoshida¹, Takao Kagawa¹, Tatsuya Noguchi¹

1. Graduate School of Engineering, Tottori University

Appearance of surface fault rupture in inland crustal earthquake affects significantly on ground motion characteristics. Somerville(2003) indicated that observed ground motions from buried ruptures are larger than earthquakes with surface rupture in period range between 0.3-3.0 seconds. Kagawa et al.(2004) explained that main causes of the difference are in seismic source characteristics of fault ruptures in between shallow and deep region, such as peak slip rate and stress drop. Inland crustal earthquakes have occurred frequently in Japan after the 1995 Kobe earthquake, and some of them had surface fault rupture (e.g., 2016 Kumamoto earthquake). In this study, we tried to construct characteristic seismic source models that composed of strong motion generation areas (SMGA) using empirical Green's function(Irikura,1986) for the M6 class inland crustal earthquake that occurred in recent years (e.g. 2013 Northern Tochigi, 2014 Northern Nagano, 2016 Kumamoto fore). Finally, we compared obtained SMGA parameters, and we confirmed depth dependency of SMGA source parameters with scaling relationship of previous studies.

Reference

Somerville, P. G.(2003) : Physics of the Earth and Planetary Interior, 137, 201-212.

Kagawa et al.(2004) : Earth planet and space, 56, 3-14.

Irikura(1986) : 7th Japan Earthq. Eng. Symp., Tokyo, 151-156.

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