Oral | Symbol S (Solid Earth Sciences) | S-SS Seismology

[S-SS23_1PM2]Strong Ground Motion and Earthquake Disaster

Convener:*Kentaro Motoki(Kobori Research Complex), Chair:Kentaro Motoki(Kobori Research Complex)
Thu. May 1, 2014 4:15 PM - 5:45 PM 211 (2F)
Strong ground motion has social impacts as it induces earthquake disasters. We solicit contribution on any seismological topics related to strong ground motion that includes, but are not limited to, source processes, wave propagation, and site effects. We also welcome contribution on earthquake related disaster mitigation.

5:00 PM - 5:15 PM

[SSS23-P20_PG]Source process of the Feb. 25, 2013 Tochigi Hokubu Earthquake (M 6.3) [2] -Analyses using Empirical Green's Functions-

3-min talk in an oral session

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Keywords:Source process, Crustal earthquake, Near source, Strong motion, 2013 Tochigi Hokubu earthquake

INTRODUCTION An M6.3 earthquake occurred in the northern part of Tochigi prefecture on February 25, 2013. A high acceleration strong motion, over 1 G, was observed at the TCGH07 (Kuriyama-west) of KiK-net, which is situated close to the source region. To explain the reason why such strong acceleration was observed, the author has made the studies using the source process analysis and spectral inversion method to separate site and path effects. However, in the source process inversion, it is difficult to calculate accurate theoretical Green's functions in good enough level, because of the difficulty of making accurate subsurface structures. Consequently, the degree of coincidence between observed and calculated waveforms was not so good. To overcome such the drawbacks in the source process inversions, the author uses the observed waveforms from a small earthquake as empirical Green's functions (EGF) in this study.**FAULT MODEL and OUTLINE of ANALYSES** Tentative analyses are performed with same fault geometry with Hikima (2013, SSJ fall meeting). The fault model was made using the relocated hypocenters, determined by the DD method, and the F-net mechanism solution. The strike direction is NNW-SSE (165 degree in strike, 80 degree in dip). The fault plane is divided in 1km size for the inversion. The source process is inverted by the multi time window analysis (Yoshida *et al*. (1996), Hikima (2012)). The velocity waveforms, filtered between 0.03 and 1.5Hz, are used in the inversion analyses. The waveforms at TCGH07 are not used in the inversion, because the station is too close from the fault plain. Only the transverse components are used in this study, to weight the S-wave portion of the waveforms. The waveforms from the Mw 4.0 foreshock, which occurred on 15:26, February 25, 2013, are used as EGFs.**RESULT** Tentative result shows a more concentrated slip distribution than the former results by the theoretical Green's functions (Hikima, 2013). The high moment release area is about 4km * 3km. However, the image of the rupture, whose slip propagates to the north, is almost same as former results. The coincidence between observed and calculated waveforms in this study is fairly better than the result by theoretical Green's functions. Only one result using single EGF has been explained in this abstract. However, many other small earthquakes, which will be candidates for EGFs, occurred in the source area. So the results using other EGFs will be shown and I will discuss the accuracy of resultant slip distributions at the time of the presentation.