Improvement of 3D model in the Kanto plain from microtremor array and seismic refraction survey for ground motion simulation

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1984 Western part of Nagano Prefecture Earthquake (M: 6.8) occurred at central Honshu Island in Japan with heavy damaged around the source area. This event was recorded at some JMA observation stations. Koyama et al. (1992) pointed out one of some records had a distinct later phase with a delay time of 1 minute after arrival of initial S wave only at Kumagaya JMA station in the northern part of Kanto plain. We carried out FD simulations of the long period ground motion during 1984 Western part of Nagano Prefecture Earthquake which generated similar later phase using the three-dimensional underground structure model proposed by Yamanaka and Yamada (2002). The synthetic waveforms of the FD simulations showed the distinct later phase only at Kumagaya. The analysis indicated the appropriateness of the Koyama's interpretation. Although, we can simulate qualitative feature of the observed motion at Kumagaya, perfect matching of the synthetics and observation is still difficult task. We noticed the reason of the bad result was uncertain of the 3D structure of sedimentary valley. Therefore, we improved the underground structure model in this area by the data of microtremor array measurements and explosion seismic wave survey in the Takasaki area. The re-constructed model leaded better synthetic waveforms than previous simulations of that earthquake.