

A Hamiltonian particle method with staggered technique for simulating strong ground motion

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We applied staggered particle technique to a Hamiltonian particle method (HPM). In finite difference methods (FDM), staggered grid technique has been used for improving the accuracy of calculations. Staggered grid in FDM defines the variables at the different positions. However, the variables in HPM are defined at the same position in the previous studies. In the present study, we displace the variables at the staggered positions same as FDM.

We calculate surface wave propagation using a half space model, and compare the result from HPM with analytical solution. Our results indicated that the staggered technique improve the accuracy of HPM.

Keywords: particle method, staggered particle, seismic wave propagation