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# Numerical Study on Spatial Correlation Characteristics of Tsunami Inundation Depth

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For a probabilistic tsunami risk assessment of multiple sites, it is important to consider the spatial correlation between tsunami inundation depth and the sites because it affects the aggregated probability distribution of site damages. Various uncertainties such as ground motion, building response characteristics, and material strength are considered in the probabilistic seismic risk assessment. However, any research that evaluates the spatial correlation characteristics of tsunamis is yet to be reported. In this study, we evaluate the macro spatial correlation coefficient of the tsunami inundation depth according to the relative distance in the tsunami run-up region. We firstly constructed the fault parameters of the Sagami trough earthquake which has a large slip off the Kanto area in Japan. The moment magnitude of the earthquake is 8.7, and there are 6,149 small faults. Using the initial water level calculated from the earthquake parameters as input data, we solved the continuous equation and 2D linear long wave equation, targeting Zushi city, Kanagawa Prefecture. The maximum tsunami inundation depth was 8.71 m. We regressed the exponential function ($\rho(x) = a\exp(bx) + c\exp(dx)$) for the relationship between the distance from the coastline and the tsunami inundation depth. As a result, we obtained an evaluation formula with a relatively high accuracy. The coefficient were a = 0.4555, b = −0.1653, c = 0.5434, d = −0.007345 and the determination coefficient was 0.992. The results of this study can be used for a probabilistic tsunami risk assessment for multiple sites.