

Fundamental study for seawall collapse simulation during Tsunami by using a particle method

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In 2011, Tohoku-Kanto earthquake tsunami caused serious damage on the infrastructures. Soil scour and erosion behind the seawall had occurred during the overflow, and it may become one of the main reasons for the collapse of seawall. Fluid-Structure-Soil coupling simulation is desired for a systematic comprehension of seawall collapse mechanism, and it may help to develop next disaster prevention method. In this study, a new numerical simulation tool for the Fluid-Soil interactions problem is developed as a fundamental study related to the soil scour and erosion.

SPH Method has been selected as a basic numerical simulation method for Fluid-Soil interactions. In this research, soil is modeled by a Bingham flow model which is one of the Non-Newtonian fluids, and the Mohr-Coulomb criterion is utilized in the plastic yield judgment.

Finally, efficiency and adequacy of the proposed simulation technique has been validated through an application to one of experimental test.

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