

Numerical simulations of debris flow by the smoothed particle hydrodynamics

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The debris flows are an important phenomenon since it can threaten the human lives.

Since the laboratory experiment of debris flows in real scale is hard to perform, numerical simulations play an important role to evaluate their impact.

Among several candidates, the smoothed particle hydrodynamics (SPH) is an attractive numerical method for this purpose.

SPH is a particle-based numerical hydrodynamic method, which is originally developed in the astrophysical field and then extended to elastic bodies.

Several works have been already published which tested the applicability of SPH to the debris flow.

We, however, state that the accurate treatment of the elastic bodies tends to be computationally expensive.

Thus, we have developed a massively parallel SPH code with various state-of-the-art numerical flavours.

Our code can work on up to the full nodes of Japanese supercomputer K.

We will show the comparison between numerical simulations and laboratory experiments.