

Speed-up efficiencies of an SPH code with FDPS on GPUs or PEZY-SCs

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Since the many important phenomena in planetary science are difficult to study by means of laboratory experiments, numerical simulations play an important role.

Smoothed Particle Hydrodynamics (SPH) is a widely used particle-based numerical hydrodynamic simulation method, which has advantages to deal with large deformation, multi-component and self-gravity.

Since the reliability of SPH depends on the number of particles used in each run, high-performance computing can be an important topic.

However, compared to mesh-based methods, it requires relatively high computational costs.

We have developed a framework, Framework for Developing Particle Simulator (FDPS) which automatically parallelise an arbitrary particle-based numerical code.

Thus, recently, it has been popular to apply so-called "accelerator", such as GPUs, to SPH.

Combining these two techniques, we have developed a massively parallel SPH code which works on either GPUs or PEZY-SCs.

We will report the speed-up efficiency of our code.

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