Abstract

In this paper, we present the computer simulation of motions of micro-size solid wastes particles dispersed in water. The physical theory describing dynamics of particles is used. Particles equations of motion are formulated and are solved numerically by using the standard fourth-order Runge-Kutta method to obtain the micro-particle trajectories. Many particle trajectories are traced out to investigate capture behavior. Computing of each trajectory is optimized by using variable time step scheme. Overall simulation procedures are speedup by using parallel algorithm based on OpenMp. All trajectory computation is distributed to a group of computing threads. Each thread computes, in each time step, its occupied trajectories in parallel. After all trajectories are computed, a master thread is dedicated as the rendering thread for displaying all trajectories using OpenGL.

References

- Nishijima, S., Takeda, S. I. Superconductin High Gradient Magnetic Separation for
- Paulius, M. 2009. 3D finite difference computation on GPUs using CUDA. In Proceeding of 2nd Workshop on General Purpose Processing on Graphics Processing Units.
- Li, K., Kong, F. 2009. Parallel 3D finite difference time domain simulation on graphics processors with CUDA. In Proceeding of International Conference on Computer Intelligence and Software Engineering.

Index Terms

Computer Science
Applied Sciences
Keywords
High gradient magnetic separation  Trajectories simulation  OpenMp  OpenGL