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**Development of modified body-force type immersed boundary method** TOMOYA WAKAMATSU, TAKUYA TSUJI, TOSHITSUGU TANAKA, Osaka University — Particulate flows occur frequently in nature and engineering applications. Examples include fluidized bed, transportation of aerosols, blood flow and so on. The behavior of flows is highly complex and it is still difficult to obtain reliable information experimentally and a computational prediction is required especially for the microscopic flows in the particle-level. In recent years, a number of CFD technique for fluid-solid interaction problems have been proposed. Some examples are immersed boundary method, lattice Boltzmann and fictitious domain method. “Body-force type immersed boundary method” originally developed by Kajishima et al. (2001) is a simple scheme and have been applied to several problems. The method is based on a fixed Cartesian grid and solid body is represented by its volume fraction at each calculation cell. The method is quite efficient while it has intrinsic problems such as  $\Delta t$ -dependency of calculation results and the violation of divergence-free condition. In the present study, these problems are revealed and a modified method is proposed. Computations based on the present method are performed for a number of fluid-particle interaction problems and results are compared with the original one.

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