

# Boundary tracking method based on the weighted relative distance for particle methods

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## ABSTRACT

Particles methods are versatile tools to analyze multiphase flows and free surface problems due to their easiness of tracking moving boundaries even with huge deformations. However, many boundary tracking methods are simple to implement but with low accuracy and other methods provide very good detection results at complicated implementation cost or high computational time. In the particle method called Moving Particle Semi-implicit (MPS) method [1], the accuracy of the boundary particles tracking methods affect the precision of the pressure calculated by the method and the interaction between fluid phases. There are many boundary particles tracking methods based on the geometry of the neighbouring particles distribution [2], [3], the properties of the particles [1], counting of neighbour particles [4], gradient vector of a property of the particles [5], relative distance between particles [6] and a combination of different methods [7]. In the present work, an alternative boundary particles detection method is proposed to improve the accuracy of the boundary particles detection and keeping the implementation easy. It is based on a combination of the method proposed by Koshizuka & Oka [1] based on the particle number density and the weighted relative distance between particles.

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