Explicit moving particle simulation method for milk crown and water drip

M. Yokoyama*, Y. Seta[†] and G. Yagawa[††]

[*] School of Information Science, Meisei University, 2-1-1 Hodokubo, Hino, Tokyo, Japan
Correspondig auther, E-mail: masao.yokoyama@meisei-u.ac.jp
[†]School of Information Science, Meisei University
[††]Nuclear Safety Research Association, 5-18-7 Shinbashi, Minatoku, Tokyo, Japan

ABSTRACT

Numerical simulation of water splash, one of the typical free surface flows, was performed using the Moving Particle Simulation (MPS) method, which is considered an effective method for calculating fluid with free surface. So far, the authors have performed some simulation studies of water splash by a falling ball using the MPS method, validating the models of expressing the slip effect and interfacial tension of the ball [1].

In the present study, numerical simulations of the splash by milk-crown and the water drip spilling from the edge of the cup were respectively carried out (Figs. 1 and 2), where a massively parallel calculation was employed with the Explicit MPS method. As the result, the projection of the milk crown and its tips such as spikes could be expressed in a precise and distinct manner. Our simulation result was also in good agreement with the experimental result in terms of the form of spike and the width of splash.

Next, the simulation of dripping water from the edge of the cup[2] was carried out in this paper. The simulation was successfully prerformed by expressing water adhesion by introducing the wetness model of the wall.
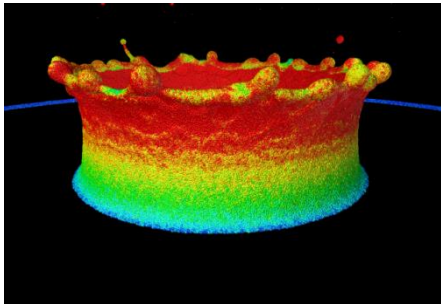
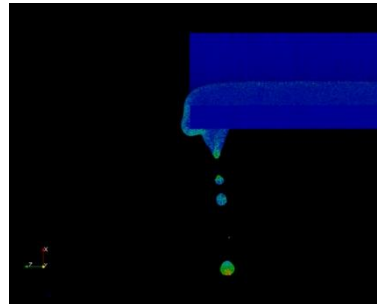**Figure 1.** Simulation result of milkcrown.   **Figure 2.** Simulation result of water drip.

REFERENCES

[1] M. Yokoyama, Y. Kubota, K. Kikuchi, G. Yagawa, and O. Mochizuki, "Some remarks on surface conditions of solid body plunging into water with particle method" *Advanced Modelling and Simulation in Engineering Sciences*, Vol. 1(1), pp.1-14 (2014).

[2] Y. Seta, M. Yokoyama, M. Makino, G. Yagawa, Application of Particle Method to Liquid Dripping, *Proceedings of WCCM XII*, Korea (2016).