

Numerical simulation of a droplet impact onto a thin liquid film using SPH method

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In this paper, we investigated behavior of splash by the impact of liquid drop onto a thin liquid layer. We carried out three-dimensional computational simulations of this phenomenon using the smoothed particle hydrodynamics (SPH) method. To take into account of surface tension, Morris's model was used[1]. We focus on the relationship between thickness of the liquid layer and the characteristics of the splash and mixing. Furthermore, we have compared these simulations with experimental data. For various thickness of the liquid layer, characteristics of the calculated crown show good agreement with available experimental data. Meanwhile, it is found mixing features depend on the depth of the liquid layer.

REFERENCES

- [1] J. P. Morris, Simulating Surface Tension with Smoothed Particle Hydrodynamics, Int. J. Number. Methods Fluids 47, 139-159, 2005.