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Discussion of jump condition at gas-liquid interface YUKIHIRO YONEMOTO, TOMOAKI KUNUGI, Kyoto University — A modeling of gas-liquid interface is one of key issues of the numerical research on multiphase flow. Currently, the Continuum Surface Force model (CSF: Brackbill et al., 1992) is popular to model a gas-liquid interface in computational fluid dynamics. However, the CSF model cannot explain the physics of the gas-liquid interface because this model is derived by a mechanical energy balance at the interface. As a practical matter, we must consider the physics of bubble coalescence or breakup, soap bubble and so on. In this study, assuming that the interface is a thin membrane and has a finite thickness, we develop a new mathematical model of the gas-liquid interface based on thermodynamics and mathematical approach. In particular, we derive the equation of free energy based on Lattice gas model including both influences of the electric double layer caused by a contamination and the jump condition at gas-liquid interface treated by thermodynamics. Finally, we compare this thermodynamic jump condition with the conventional one.

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