Abstract

THIS WORK FOCUSES ON THE EXTENSION of an already existing particle finite element method (PFEM) solver : `PFEM3D`. The goal is to extend its reach of applicability in order to model liquid-substrate phenomena, such as the capillary effect, the formation of a contact angle at the contact line, and dissipation due to friction at the liquid-substrate contact, which are predominant effects at small-scale fluid dynamics problems. For this purpose, the PFEM implementation of `PFEM3D` is compared with a state of the art model : the lacking contributions are identified and added to the computer model. A set of verification tests is then performed to verify if the obtained results are comparable to those provided by the reference source. After extensive validation of the numerical model, a simple implementation for contact angle hysteresis is suggested.