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**Calculation of Drag and Lift for a Deformable Droplet in a Shear Flow** YOUNGHO SUH, CHANGHOON LEE, Yonsei University — Significant efforts have recently been made to numerically investigate the drag and lift forces of a liquid droplet in a shear flow. The droplet deformation induced by interplay between surface tension and shear stress on the surface can affect the droplet behavior. In most previous studies, however, only the spherical droplet without deformation has been considered in the shear flow, and thus understanding of effects of droplet deformation on drag and lift characteristics lacks. In this study, the droplet behavior in the linear shear flow is numerically investigated by a level set method, which is improved by incorporating a sharp-interface modeling technique for accurately enforcing the matching conditions at the liquid-gas interface. Computations were carried out to investigate the deformation behavior of droplet caused by the linear shear flow with various shear rate, droplet size and flow velocity. Also, the effects of deformation of droplet on drag and lift forces acting on droplet are presented. In the computation, to determine the acting force on a droplet in shear flow field, the feedback forces which can maintain droplet position were adopted for efficient handling of deformation.

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