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Transient drop dynamics in convergent-divergent tubes filled with liquids SHAOPING QUAN, Institute of High Performance Computing — The transient dynamics of a deformable drop with initial momentum moving in convergent-divergent liquid-filled tubes is numerically studied by the moving mesh interface tracking (MMIT)/finite volume method. The geometry effects of the tube on the drop deformation and on the drag coefficient are investigated by varying the radius of the tube neck, and the smallest neck radius is 1.25 times of the initial droplet radius. The deformability effects on the droplet dynamics are examined by simulating cases with three Weber numbers. The drop experiences a dramatical deceleration as it approaches and enters the narrow region of the tube, and the drag coefficient increases with the decrease of the radius of the neck. As the Weber number increases, the droplet deforms more, and for the largest Weber number, the initially spherical droplet deforms to a Taylor-drop like shape, especially for the tube with the narrowest neck. After the drop exits the neck, the drop experiences oscillations. The thin film between the drop and the tube wall in the narrow region is resolved by local mesh adaptations. The quantitative analysis will be presented.

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