

Abstract Submitted  
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**Numerical studies on some unsteady motion of a falling** YOUNG-JU LEE, UCLA, ANDREW BELMONTE, Penn State University, JINCHAO XU, Penn State University — We shall report some new numerical experiments on unsteady motion of a falling sphere through a cylinder. The main motivation of our studies is to provide an initial attempt to identify a model responsible for a recent experimental result on a continual and irregular oscillation of a falling sphere in a worm-like micellar fluid, (Jayaraman and Belmonte (2003), Phys. Rev. E, 67). For our simulations, we select the Johnson-Segalman model, a non-monotonic shear stress-strain rate displayed by the model for the steady shear flow is suggested and possible to produce such an unusual behavior of sphere. In this talk, we briefly introduce our novel approach to simulate viscoelastic models and then report extensive numerical experiments from our falling sphere simulations. In particular, our reports shall be focused on the sensitivity of an oscillation of a sphere and also a negative wake to the slippage parameter that appears in the Gordon-Schowalter derivative.

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