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Significance of viscoelastic effects on the rising of a bubble and bubble-to-bubble interaction ARTURO FERNANDEZ, North Carolina A&T State University — Numerical results for the rising of a bubble and the interaction between two bubbles in non-Newtonian fluids will be discussed. The computations are carried out using a multiscale method combining front-tracking with Brownian dynamics simulations. The evaluation of the material properties for the non-Newtonian fluid will be discussed firstly. The results from the computations of a single bubble show how elastic effects modify the deformation and rising of the bubble by pulling the tail of it. The relationship between the strength of the elastic forces and the discontinuity in the bubble terminal velocity, when plotted versus bubble volume, is also observed in the computations. The bubble-to-bubble interaction is dominated not only by elastic effects but also by the shear-thinning caused by the leading bubble, which leads the trailing bubble to accelerate faster and coalesce with the leading bubble.

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