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Interfacial dynamics of a liposome deforming in an axisymmetric extensional flow ANDRES GONZALEZ-MANCERA, CHARLES D. EGGLETON, University of Maryland, Baltimore County — Liposomes are self-enclosed structures composed of curved lipid bilayer membranes which entrap part of the solvent in which they freely float. They are predominantly made from amphiphilic molecules, a special class of surface-active molecules. Liposomes have various applications in science and technology including drug delivery systems, medical diagnostics and they can also be used as simple cellular models for basic research. We simulated the deformation of a liposome in an axisymmetric extensional flow using the boundary integral method. The liposome deforms due to hydrodynamic loading on the interface. The dynamics of the system are characterized by the competition between the hydrodynamic and interfacial forces. The lipid bilayer membrane can be modeled as a hyperelastic continuous material or a liquid-liquid interface with a highly packed surfactant layer. We compare the deformation behavior of liposomes with both types of interfaces and identify similarities and differences between the two models.

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