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**Micromorphic Theory of Bubbly Fluid Mixtures** WEIMING LI, SAMUEL PAOLUCCI, University of Notre Dame — We use a continuum theory for multiphase immiscible mixtures with inner structure. Based on micromorphic theory, the average balance equations for the different phases, as well as for the mixture, result from a systematic averaging procedure. In addition to equations for mass, momentum, energy and entropy, the balance equations also include equations for microinertia and microspin tensors. These equations, together with appropriate constitutive equations consistent with the entropy inequality, enable the modeling of immiscible multiphase materials where internal parameters are important. Here, we apply the results to a two-phase simple microstretch (expansion or contraction) bubbly fluid mixture. We show that the equations for microspin and microinertia, under a number of simplifying assumptions, combine to yield a general form of the Rayleigh-Plesset equation.

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