1075-76-228 **Peter Vorobieff*** (kalmoth@unm.edu), The University of New Mexico, MSC01 1150, Albuquerque, NM, and **Michael Anderson**, **Joseph Conroy**, **Ross White**, **Patrick Wayne**, **Sanjay Kumar** and **C. Randall Truman**. *Particle lag instability.*

We describe an instability that develops in multiphase flows where a small volume fraction of the medium (e.g., gas or plasma) is occupied by the embedded phase (particles, drops, etc.). If the distribution of that embedded phase is non-uniform, so is the average density, and acceleration (constant or impulsive) of the medium with the embedded phase results in vortex formation, in a fashion somewhat similar to vortex roll-up due to the well-known Rayleigh-Taylor and Richtmyer-Meshkov instabilities. The latter, however, develop on a density interface (sharp or diffuse) between single-phase media of different densities. The physical mechanism responsible for the new instability appears quite different, in particular, in the case of impulsive acceleration, where particles or droplets lag behind the accelerated gas (or plasma), with the resulting momentum exchange between the phases responsible for production of shear and thus for vortex roll-up. (Received August 30, 2011)