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**Particle Dynamics in Bi-Disperse Liquid Fluidized Beds** PHIL SEGRE, Emory University Physics Dep, GARY L. HUNTER, JAMES DAVID-HEISER, ELIZABETH BAKER, Emory Univ. Physics Dep. — We study particle velocities and concentration profiles of mixtures of 2 different sized particles in concentrated liquid fluidized beds. For binary systems of particles of the same density, we find that there is always a complete phase separation in the bed. The larger particles occupy a zone in the lower part of the bed, and the smaller ones a zone in the upper part. For binary systems of particles of *different* density materials, conditions are found where the binary particles are either fully separated, partially mixed together, and at a single point called the inversion point, fully mixed into a one phase state. Results will be presented on the phase diagrams of several binary suspensions as well as the properties of the velocity fluctuation magnitudes and spatial correlation lengths.

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