Relative velocities of inertial particles in turbulent aerosols

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I summarize what is known about phase-space singularities (caustics) in the dynamics of inertial particles suspended in random flows. Caustic formation is well understood in terms of a local theory. I discuss consequences for the fluctuations of relative velocities of inertial particles. The results are supported by results of direct numerical simulations of inertial particles in model flows, and in qualitative agreement with results of direct numerical simulations of inertial simulations of inertial particles.