A particle sedimentation model of buoyant jets based on observations of hydrothermal plumes

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The input for standard models of buoyant jets (whether volcanic or hydrothermal in origin) only specifies volume flux and particle concentration at the vent. This is appropriate for volcanic eruption plumes, where any information is likely to be localized at the vent. However, in seafloor hydrothermal systems, the particle concentrations within the plume are more easily measured than estimates of input particle flux based on chemical concentrations and predictions (there are no particles in the exiting fluids; they precipitate after the vent fluid mix with seawater). Thus, we are developing a particle sedimentation model that uses observed velocity and particle distributions in plumes (from remote sensing acoustic images of hydrothermal plumes) as input. As satellite observation of volcanic clouds become more sophisticated this may have broader applicability.