Role of dispersed particles on the dynamics of the umbrella cloud of a buoyant plume SRIDHAR BALASUBRAMANIAN, HARISH MIRAJKAR, AYAN KUMAR BANERJEE, Indian Institute of Technology Bombay — Particle-laden buoyant plume is a common occurrence in geophysical flows. We quantitatively study the modification in the plume behavior under the influence of low particle volume fraction, $\phi_v$. Particles with mean diameter $d_p=100\,\mu m$, density, $\rho_p=2500\,kgm^{-3}$, and $\phi_v=0-0.7\%$ were injected along with the lighter plume fluid. A particle trough, characterized by radius, $R$, and depth, $L_p$, was observed and could be attributed to the phenomenon of “particle fall-out” and “particle re-entrainment”. The trough either sustains or collapses depending on the plume conditions at the source.