Abstract Submitted
for the DFD14 Meeting of
The American Physical Society

Parameterization of the scavenging coefficient for particle scavenging by drops STEVEN FREDERICKS, J.R. SAYLOR, Clemson University — The removal of particles by drops occurs in many environmentally relevant scenarios such as particle fallout from rain, as well as in many industrial applications such as sprays for dust control in mines. In applications like these the ability of a drop to scavenge a particle is quantified by the scavenging coefficient, E, which is the fraction of particles removed. Though the physics controlling particle scavenging by drops suggests that E is controlled by several dimensionless groups, E is typically correlated to just the Stokes number. A survey of published experimental data shows significant scatter in plots of E versus the Stokes number, occasionally exceeding three orders of magnitude. There is also a large discrepancy between the published theories for E. A parameterization study was conducted to ascertain if and how inclusion of other dimensionless groups could better collapse the extant data for E and the results of that study are presented in this talk. Brief mention will also be made of recent experiments by the authors where E was measured for a liquid drop suspended in an ultrasonic standing wave field, where the drop diameter and gas velocity can be independently varied unlike the more typical experiments where these quantities are coupled.

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Date submitted: 31 Jul 2014 Electronic form version 1.4