

Abstract Submitted  
for the DFD20 Meeting of  
The American Physical Society

**Methods for improving the particle sizing resolution of inertial impactors using ring shaped deposits**<sup>1</sup> SHIVUDAY KALA, J.R. SAYLOR, Clemson University — Inertial impactors are devices used to measure the size distribution of particles in a flow. These instruments are robust and widely used, however the number of bins in the resulting size distributions are limited by the number of impactors in an impactor cascade. Recent research shows that under proper conditions, the normally disc shaped deposition pattern takes the form of a ring whose diameter can be correlated to the particle diameter. This result opens the door to much higher resolution particle size distributions for an impactor cascade, or even for a single impactor. Herein, experiments are presented revealing these ring-shaped deposition patterns on glass substrates for a range of particle sizes, further illustrating the effect. The ring diameter is correlated to the particle diameter and Stokes number. Additionally, computer simulations of particle trajectories are presented, revealing the underlying mechanism of this effect.

<sup>1</sup>This material is based upon work supported by the National Science Foundation under Grant No. 1804304

Shivuday Kala  
Clemson University

Date submitted: 31 Jul 2020

Electronic form version 1.4