

Abstract Submitted  
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**On the Calculation of Planar Spray Characteristics from Point Sampled Data** KYLE BADE, RUDI SCHICK, Spraying Systems Co., SPRAY ANALYSIS AND RESEARCH SERVICES TEAM — An investigation into methods used to generate planar spray characteristics, such as mean drop size and velocity, from discrete measurement points is conducted. Two sprays are investigated, a hydraulic full cone spray, and an air-atomized multi-orifice spray, where an excessive number of sample-point locations are acquired using a Phase Doppler Interferometer (PDI) resulting in overly resolved spatial resolution, at a single axial plane. Due to the intentional spatial over-sampling, the data may be downsampled to determine the minimum number of required sample points to calculate reliable mean spray values. For each spray pattern, the influence of various spatial subsets of sampling points is investigated to determine the minimum number of required sample points for accurate planar results; normalized metric are developed to govern the number of sample points. In a related effort, meaningful average values are calculated using weighting methods and assessed for relative influence on the final calculations. Specifically, volume flux and discrete area weighting methods are developed and evaluated. The results of this investigation allow a minimum number of data points to be processed into reliable planar spray characteristics.

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