



Article

## Prediction of Droplet Size and Velocity Distribution in Droplet Formation Region of Liquid Spray

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Received: 12 April 2010 / Accepted: 20 May 2010 / Published: 10 June 2010

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**Abstract:** Determining the distributions of size and velocity of droplets formed at the end of primary breakup region is followed in this paper. The droplet formation stage at the end of primary breakup is random and stochastic and it can be modeled by statistical means based on the maximum entropy principle (MEP). The MEP formulation predicts the atomization process while satisfying constraint equations based on conservations of mass, momentum and energy. This model is capable of considering drag force on produced droplets through gas-liquid interaction using new approach. The model prediction is compared favorably with the experimentally measured size and velocity distributions of droplets for sprays produced by the two nozzles of considerably different geometries and shows satisfactory agreement.

**Keywords:** maximum entropy; spray; droplet; size-velocity distribution; probability

**PACS Codes:** 47.55.-t

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