

## **CHARACTERIZATION OF AGRICULTURAL SPRAY BY DIGITAL ANALYSIS OF SHADOWGRAPHY IMAGES**

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Agricultural sprays are among the most common two-phase flows studied because their characteristics determine the efficiency of treatment as well as environmental contamination. At present, the relevance of different characterization techniques of the highly polydispersed sprays used in this application remains controversial. Digital analysis of shadowgraphy images presents an attractive option for the characterization of both velocity and size of droplets present in the spray.

This study presents an overview of the contrast problems inherent in the use of backlighted images and propose appropriate solution to ensure the quality of measurements. Generally, background light presents heterogeneities associated with light sources and optical arrangement. These can be solved by subtracting from each images a composite background. An other particular focus is given to one major drawback of volumetric lighting, the presence of out focus droplets. These droplets have to be removed during the image analysis process because the measurement of their diameters can't be done accurately. The rejection of these out of focus objects is based on a quantitative parameter which was calibrated with a obliquely shot monodispersed spray.

The final step of the image processing is determining velocity of the droplet by tracking a same droplet on two successive images. The tracking algorithm is based on the size of the droplet, its more probable displacement and its direction.