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Experimental Investigation of Two-phase Flow in a Porous Plate Turbulent Wake KRISTIN TRAVIS, SARAH E. SMITH, Portland State University, MICKAL BOURGOIN, ENS de Lyon, HENDA DJERIDI, LEGI, Universit Grenoble Alpes, RAL BAYON CAL, Portland State University, MARTN OBLIGADO, LEGI, Universit Grenoble Alpes — This study presents the findings of a wind tunnel experiment investigating the behavior of micrometric inertial particles in the turbulent wake of a stationary porous plate. Various concentrations [$\phi_v \in (4.3 \times 10^{-6} - 7.1 \times 10^{-6})$] of polydisperse water droplets (mean diameter of 40 μm) are compared to sub-inertial tracer particles. Hot-wire anemometry, phase Doppler interferometry and particle image velocimetry were implemented in the near and far wake regions to study the complex dynamics of such particles. Turbulence statistics and particle size distributions are presented. Quadrant and Voronoi analysis are used to explore the shear effects of the particle wake interaction and preferential concentrations respectively.

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