

Abstract Submitted
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Experimental investigation on rigid rod-like particles suspensions in archetypal flows by means of Particle Image Velocimetry ALESSANDRO CAPONE, ALFREDO SOLDATI, University of Udine, GIOVANNI PAOLO ROMANO, University of Rome La Sapienza — Results from an experimental investigation on rigid rod-like fiber particles suspensions in a turbulent pipe jet flow and a backward facing step flow using Particle Image Velocimetry are presented with a focus on turbulence modulation and fiber distribution and orientation. Specific post processing phase discrimination steps allowed simultaneous calculation of carrier and dispersed phase velocities. A turbulent pipe jet flow configuration was investigated in the jet near field region ($<5D$, where D represents the pipe diameter) within a Reynolds number range 8000-15000, based on D and jet bulk velocity. A turbulent backward facing step flow was analyzed up to $10H$ downstream of the step at a Reynolds number of 12000, based on step height H and maximum mean velocity. Both flows were tested at two fiber volume concentration $C1=0.0001$ and $C2=0.0005$. Results on turbulence modulation are presented as well as fiber concentration and distribution findings. High spatial resolution of backward facing step flow data and specific algorithms allowed fibers orientation detection and orientation distribution calculation. Results from fibers preferential orientation and distribution in the wall-normal direction at selected channel locations and along the flow direction are presented.

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