

Turbulence modulation effects by finite-size ellipsoidal particles

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In this work we study turbulence modulation effects by rigid particles in homogeneous isotropic turbulence experimentally. We perform Stereoscopic Particle Image Velocimetry (SPIV) on both the fluid phase and the portion of the index-of-refraction matched particle on the plane illuminated by the laser sheet. These measurements yields the fluid-phase velocity and, thanks to a novel particle tracking algorithm, linear and angular velocities of the particles. Here we present statistics about the fluid phase. In particular we focus the discussion on the modification of the turbulent kinetic energy and of the turbulent spectra by particles of size in the range of the Taylor scales. Experiments have been performed with both spherical and ellipsoidal particles and spectral-pivoting has been observed for both cases.