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The Effect of Bubbles on Developed Turbulence

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We report on measurements of energy spectra, second and higher order structure functions in bubbly turbulence. The void fraction is up to 2.9% with an mean equivalent bubble size of 3–5 mm. We find the results of [I. Mazzitelli, D. Lohse, F. Toschi, Phys. Fluids 15, L5 (2003)] qualitatively confirmed, i.e. a more pronounced energy enhancement on small scales than on large scales due to the presence of the bubbles, leading to a less steep slope in the spectrum as compared to the Kolmogorov -5/3 law.

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