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Motion of a Thread in Compressible Turbulence RORY CERBUS, WALTER GOLDBURG, Department of Physics and Astronomy, University of Pittsburgh — Particles that float on a turbulent tank of water form a system that is compressible in the two dimensions on which they move. Here we study, with an overhead camera, the snake-like motion of a 10 μm thread that floats on the surface. The thread, of length much greater than the integral scale L_I of the underlying turbulence, cannot respond to the small-scale turbulent motions at the surface; its Young's modulus is too large. As a result, the mean curvature of the thread is of the order $1/L_I$. Measured properties include velocity structure functions of the thread $S_n(r)$ (including the third moment), the local curvature along the thread (a random variable), and "Richardson diffusion" of pairs of points along the thread separated by distances r. Supported by NSF Grant DMR 0604477 and the Okinawa Institute of Science Technology.

Rory Cerbus
Department of Physics and Astronomy, University of Pittsburgh

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