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Search for Conformal Invariance in Two-dimensional Compressible Turbulence

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We present a viable way of experimentally testing for conformal invariance at the surface of a turbulent fluid. The theory being tested here is related to the behavior of random curves on a plane and is associated with the work of Loewner, Schramm and others. It is usually referred to as Schramm-Loewner evolution (SLE). The scalar random variables that are put to this test are the vorticity and the divergence of the surface flow. Both of these variables display certain characteristics of Brownian motion, but the divergence field does not exhibit the Gaussian behavior required by SLE.