

Abstract Submitted
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Conformal invariance in two-dimensional turbulence GUIDO BOFFETTA, University of Torino, Italy, DENIS BERNARD, Ecole Normale Supérieure, Paris, ANTONIO CELANI, Institut Pasteur, Paris, GREGORY FALKOVICH, Weizmann Institute, Israel — We show that some features of two-dimensional turbulence display conformal invariance. In particular, the statistics of vorticity clusters in the inverse cascade is equivalent to that of critical percolation, one of the simplest universality classes of critical phenomena. Vorticity isolines are therefore described by Stochastic Loewner Equation curves SLE_6 . This result is generalized to a class of 2d turbulent systems, including Surface Quasi-Geostrophic turbulence (which corresponds to SLE_4) and Charney-Hasegawa-Mima turbulence. The picture emerging from our results is that conformal invariance may be expected for inverse cascades in two-dimensions therefore opening new perspectives in our understanding of 2d turbulent flows. References:

D. Bernard, G. Boffetta, A. Celani, and G. Falkovich, *Nature Physics* **2** 124 (2006)
D. Bernard, G. Boffetta, A. Celani, and G. Falkovich, *Phys. Rev. Lett.* **98** 024501 (2007)

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