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Exponential growth of the vorticity gradient for the Euler equation on the torus. (English)

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Summary: We prove that there are solutions to the Euler equation on the torus with $C^{1,\alpha}$ vorticity and smooth except at one point such that the vorticity gradient grows in L^∞ at least exponentially as $t \to \infty$. The same result is shown to hold for the vorticity Hessian and smooth solutions. Our proofs use a version of a recent result by *A. Kiselev* and *V. Šverák* [Ann. Math. (2) 180, No. 3, 1205–1220 (2014; Zbl 1304.35521)].

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