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Small scales and singularity formation in fluid dynamics. (English) Zbl 1448.35398

Sirakov, Boyan (ed.) et al., Proceedings of the international congress of mathematicians 2018, ICM 2018, Rio de Janeiro, Brazil, August 1–9, 2018. Volume III. Invited lectures. Hackensack, NJ: World Scientific; Rio de Janeiro: Sociedade Brasileira de Matemática (SBM). 2363-2390 (2018).

Summary: We review recent advances in understanding singularity and small scales formation in solutions of fluid dynamics equations. The focus is on the Euler and surface quasi-geostrophic (SQG) equations and associated models.

For the entire collection see [Zbl 1437.00045].

Reviewer: Reviewer (Berlin)

MSC:

35Q35 PDEs in connection with fluid mechanics
35Q31 Euler equations
76B03 Existence, uniqueness, and regularity theory for incompressible inviscid fluids
35L67 Shocks and singularities for hyperbolic equations
35Q86 PDEs in connection with geophysics
86A05 Hydrology, hydrography, oceanography

Keywords:

Euler equation; SQG equation; two-dimensional incompressible flow; small scale creation; vorticity gradient growth; singularity formation; hyperbolic flow

Full Text: DOI