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**Blowup with vorticity control for a 2D model of the Boussinesq equations.** (English)

Zbl 1387.35066

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**Summary:** We propose a system of equations with nonlocal flux in two space dimensions which is closely modeled after the 2D Boussinesq equations in a hyperbolic flow scenario. Our equations involve a vorticity stretching term and a non-local Biot-Savart law and provide insight into the underlying intrinsic mechanisms of singularity formation. We prove stable, controlled finite time blowup involving upper and lower bounds on the vorticity up to the time of blowup for a wide class of initial data.

**MSC:**

[35B44](#) Blow-up in context of PDEs

[35Q35](#) PDEs in connection with fluid mechanics

Cited in **1** Review  
Cited in **8** Documents

**Keywords:**

nonlocal flux; vorticity stretching term; non-local Biot-Savart law; bounds on vorticity

**Full Text:** [DOI](#)

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