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Regularity criterion of the 2D Bénard equations with critical and supercritical dissipation.
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Summary: In this paper, we investigate the Cauchy problem for the two-dimensional (2D) incompressible Bénard equations. On the one hand, we prove global-in-time existence of smooth solutions to the 2D Bénard equations with critical dissipation. On the other hand, we establish several regularity criteria involving temperature for 2D Bénard equations with supercritical dissipation.

MSC:

[35Q35](#) PDEs in connection with fluid mechanics
[35B65](#) Smoothness and regularity of solutions to PDEs
[76D03](#) Existence, uniqueness, and regularity theory for incompressible viscous fluids
[76R10](#) Free convection

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Keywords:

[Bénard equations](#); [Boussinesq equations](#); [global regularity](#); [regularity criterion](#)

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