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An alternative approach to global regularity for the 2D Euler-Boussinesq equations with critical dissipation. (English) [Zbl 1431.35142](#)

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Summary: The purpose of this paper is to provide an alternative approach to the global regularity for the two-dimensional Euler-Boussinesq equations which couple the incompressible Euler equation for the velocity and a transport equation with fractional critical diffusion for the temperature. In contrast to the first proof of this result in [*T. Hmidi et al., Commun. Partial Differ. Equations* 36, No. 1–3, 420–445 (2011; [Zbl 1284.76089](#))] that took fully exploit of the hidden structure of the coupling system, the main argument in this manuscript is mainly based on the differentiability of the drift-diffusion equation.

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

[35R11](#) Fractional partial differential equations

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