Semilinear exterior problems with critical nonlinearities

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The present work studies the global behavior of solutions to the exterior problem for the evolution equations with critical nonlinearities. For the considered problems, nonexistence results are obtained, which complements the interesting recent results by Ikeda et al. [J. Differential Equations, 269 (2020), no. 1, 563-594], where critical cases were left open. Moreover, our results provide partially answers to some other open questions previously posed by Zhang [Proc. Roy. Soc. Edinburgh Sect. A, 131 (2001), no. 2, 451-475] and Jleli-Samet [Nonlinear Anal., 178 (2019), 348-365].