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Lagrangian statistics in confined two-dimensional turbulence¹ KAI SCHNEIDER, BENJAMIN KADOCH, M2P2-CNRS & CMI, Aix-Marseille University, Marseille, France, WOUTER J.T. BOS, LMFA-CNRS, Ecole Centrale de Lyon, University of Lyon, Ecully, France — We present a Lagrangian study of two-dimensional turbulence for two different geometries, a periodic and a confined circular geometry (PRL 100, 184503 (2008)). The influence of no-slip boundaries on the Lagrangian dynamics is investigated. It is found that the Lagrangian acceleration is even more intermittent in the confined domain than in the periodic domain. The flatness of the Lagrangian acceleration as a function of the radius shows that the influence of the wall on the Lagrangian dynamics becomes negligible in the center of the domain, and it also reveals that the wall is responsible for the increased intermittency. The transition in the Lagrangian statistics between this region, not directly influenced by the walls, and a critical radius which defines a Lagrangian boundary layer is shown to be very sharp with a sudden increase of the acceleration flatness from about 5 to about 20.

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