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**Centrifugal effects in rotating convection: nonlinear dynamics** FRANCISCO MARQUES, Polytechnic University of Catalonia, JUAN M. LOPEZ, ASU — Rotating convection in cylindrical containers is a canonical problem in fluid dynamics, in which a variety of simplifying assumptions have been used in order to allow for low-dimensional models or linear stability analysis from trivial basic states. An aspect of the problem that has received limited attention is the influence of the centrifugal force, because it makes it difficult or even impossible to implement the aforementioned approaches. In this study, the mutual interplay between the three forces of the problem, Coriolis, gravitational and centrifugal buoyancy, is examined via direct numerical simulation of the Navier–Stokes equations in a parameter regime where the three forces are of comparable strengths in a cylindrical container with the radius equal to the depth so that wall effects are also of order one. A variety of bifurcated solutions and several codimension-two bifurcation points acting as organizing centers for the dynamics have been found. A main result is that the flow has simple dynamics for either weak heating or large centrifugal buoyancy. The limit of zero centrifugal buoyancy is singular, and the bifurcations found by decreasing it are subcritical. Centrifugal effects primarily lead to the axisymmetrization of the flow and a reduction in the heat flux.

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