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Spatially localized convection in a rotating layer EDGAR KNOBLOCH, CEDRIC BEAUME, University of California at Berkeley, ALAIN BERGEON, IMFT, Toulouse, HSIEN-CHING KAO, Wolfram Research — We study two-dimensional stationary convection in a horizontal fluid layer heated from below and rotating about the vertical. With stress-free boundary conditions at top and bottom, spatially localized states can be found that are embedded in a self-generated background shear zone and lie on a pair of intertwined solution branches exhibiting "slanted snaking." States of this type are present even in the absence of bistability between conduction and periodic convection – a consequence of the conservation of zonal momentum.[1] With no-slip boundary conditions this quantity is no longer conserved but localized states continue to exist. These are no longer embedded in a background shear zone and exhibit standard snaking. Homotopic continuation from free-slip to no-slip boundary conditions is used to track the changes in the properties of the solutions and the associated bifurcation diagrams.[2]

[1]C. Beaume et al., J. Fluid Mech. 717, 417 (2013)
[2]C. Beaume et al., Phys. Fluids 25, 124105 (2013)

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