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Wall-attached convection in rotating annular cavities J.J. SÁNCHEZ-ÁLVAREZ, E.T.S.I. Aeronauticos Universidad Politecnica de Madrid, 28040 Madrid, Spain, E. SERRE, UMR 6181 IMT Chateau-Gombert, 13451 Marseille, E. CRESPO DEL ARCO, U.N.E.D., Dpto. Fisica Fundamental, Apdo. 60.141, Madrid, Spain, F.H. BUSSE, Institute of Physics, University of Bayreuth, D-95440 Bayreuth, Germany — Rayleigh-Bénard convection is investigated in rotating annular cavities using three-dimensional spectral solutions of the basic equations in the Boussinesq-Oberbeck approximation. At moderate rotation rates, convection modes attached to the sidewalls set in at values of the Rayleigh number significantly below the value of the onset of convection in an infinitely extended layer. In this work, we investigate the linear and nonlinear dynamics of these sidewall modes at intermediate rotation rates $\Omega = 60$ and $\Omega = 180$ and in the case of annular cavities of aspect ratio $\Gamma(\equiv \Delta R/d) = 1.5$, where $\Delta R = R_o - R_i$ and d is the height of the cavity. As the mean radius decreases from $R_m = 2.2$ to 1.4, the wall-mode convection does no longer set in along the inner cylinder because of the circumference becomes small compared to the expected mode-wavelength. Then, axisymmetric convection rolls occurs travelling slowly in the radial direction.

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