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Convective flow patterns in inclined rectangular cavities with rotation[1] RUBEN AVILA, DIANA PEREZ-ESPEJEL, Univ Nacl Autonoma de Mexico — The natural convection in inclined three dimensional rectangular cavities with rotation is numerically investigated by using a spectral element method. When the rate of rotation (Ta number) is equal to zero, the critical Rayleigh number Ra_c for the onset of transverse or longitudinal rolls is obtained by solving (using the Tau-Chebyshev spectral method) the equations of the linear stability theory. In the numerical approach, the rotation is imposed once the steady state of the longitudinal or transverse rolls is attained. The cavity rotates around an axis that is orthogonal to its cold and hot surfaces, and passes through the center of these surfaces. In all the analyzed cases, the tilted angle δ, from the horizontal, varies in the interval $0^\circ \leq \delta < 90^\circ$ (the cavity is heated from its lower surface, then an unstable condition prevails) and $90^\circ < \delta \leq 180^\circ$ (the cavity is heated from its upper surface, then a stable condition prevails). We report the influence of the Ta number on the critical Ra number, the average Nusselt number (evaluated at the hot surface), and the flow patterns in the tilted cavity.

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