Lee, T. S.
Numerical computation of fluid convection with air enclosed between the annuli of eccentric heated horizontal rotating cylinders. (English) Zbl 0753.76118

Summary: Numerical experiments are performed to study the effects of the convective fluid motion of air enclosed between the annuli of eccentric horizontal cylinders. The inner cylinder is assumed to be heated and rotating. The rotational Reynolds number (Re) is considered in the range 0-1120; the Rayleigh number (Ra) is considered in the range $10^3 - 10^6$. When the inner cylinder rotates, numerical experiments show that the multicellular flow patterns observed in stationary cylindrical annuli subside in a manner dependent on the eccentricity and the rotational Re of the inner cylinder. At higher rotational Re, the flow tends toward a uniform flow. With a fixed Ra, when the inner cylinder is assumed to rotate, the mean Nusselt number decreases throughout the flow.

MSC:

76M20	Finite difference methods applied to problems in fluid mechanics
76R10	Free convection
76U05	General theory of rotating fluids
80A20	Heat and mass transfer, heat flow (MSC2010)

Cited in **3** Documents

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