

WAVE NUMBER SELECTION UNDER ACTION OF ACCELERATED ROTATION

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Abstract: Spherical Couette flow - flow of viscous incompressible fluid between rotating spherical boundaries is studying in wide gap with radii ratio 0.5. In this gap the first instability with outer sphere at rest results in appearance of traveling azimuthal waves with wave numbers $m=3$ or $m=4$. Selection of one from two possible m was studied numerically. While the outer sphere was held stationary, the inner sphere rotational speed was increased linearly from a subcritical flow to a supercritical one. A change in the dominant m was found to depend both on initial Reynolds number and the acceleration value. The decrease of the first as well as the increase of the second results in the same sequence of m changes: $4 \rightarrow 3 \rightarrow 4$. It was shown that in the process of acceleration the meridional circulation and azimuthal velocity maxima are displaced from the pole toward the equatorial plane, and that meridional component of kinetic energy reaches its stationary value more rapidly than the azimuthal one.

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