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Inertial wave excitation in a rotating annulus with partially librating boundaries[1] ION DAN BORCIA, UWE HARLANDER, CHRISTOPH EGBERS, ABOUZAR GHASEMI V., MARTEN KLEIN, EBERHARD SCHALLER, TORSTEN SEELIG, ANDREAS WILL, Brandenburg University of Technology Cottbus-Senftenberg, MICHAEL V. KURGANSKY, Russian Academy of Sciences — Inertial waves are excited in a fluid filled rotating annulus by modulating the rotation rate of parts of the vessel boundary. This forcing leads to inertial wave beams emitted from the corner regions of the annulus due to periodic motions in the boundary layers. Firstly we use a meridional symmetrical geometry. When the forcing frequency matches with the eigenfrequency of the rotating annulus the beam pattern amplitude is increasing, the beams broaden and mode structures can be observed. The eigenmodes are compared with analytical solutions of the corresponding inviscid problem. In particular for the pressure field a good agreement can be found. However, shear layers related to the excited wave beams are present for all frequencies. Then, the meridional symmetry is broken by replacing the inner cylinder with a truncated cone (frustum). The geometry is non-separable and exhibits wave focusing and wave attractors. Under the assumption that the inertial waves do not essentially affect the boundary-layer structure, we use classical boundary-layer analysis to study oscillating Ekman layers over a librating wall that is at a non-zero angle to the axis of rotation.

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