Abstract Submitted
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Natural Convection in a rotating multilayer spherical shell system with self gravity: A simplified global circulation model[1] FRANCISCO JAVIER LIRA RANGEL, RUBEN AVILA RODRIGUEZ, ARES CABELLO, Univ Nacl Autonoma de Mexico — The onset of thermal convection in rotating multilayer spherical shells is investigated. The system consist of six concentric shells. The first spherical gap has an aspect ratio equal to 0.35, the following four spherical gaps have different aspect ratio and the sixth gap has an aspect ratio equal to 0.8. The inner and the outer spherical gaps confine Boussinesq fluids while the middle spherical gaps are treated as a thermal conductor solid. The investigation is performed for Taylor numbers between 7.E4 and 1.E6 and Rayleigh numbers between 3.E3 and 1.E6. The convective patterns and the temperature fields are presented in the most inner and outer spherical gaps. Convection is driven by the temperature difference between the inner and outer spheres and a gravitational field wich varies like r and $1/r^2$. The fluid equations are solved by using the spectral element method (SEM). The mesh is generated by using the cubed-sphere algorithm to avoid the singularity at the poles. To the knowledge of the autors the convection-conduction-convection problem presented in this paper has not been investigated previously.

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