Abstract Submitted
for the DFD16 Meeting of
The American Physical Society

A numerical study of natural convection in eccentric spherical annuli[1] ANGEL GALLEGOS, Utrecht Institute for Theoretical Physics. Universiteit Utrecht. Master's Programe., CARLOS MALAGA, Physics Department. School of Science. Universidad Nacional Autonoma de Mexico — A fluid between two spheres, concentric or not, at different temperatures will flow in the presence of a constant gravitational force. Although there is no possible hydrostatic state, energy transport is dominated by diffusion if temperature difference between the spheres is small enough. By the use of a full three-dimensional thermal lattice Boltzmann model we study the transition between the conductive, the steady convective, and the unsteady convective regimes. We use the concentric case to validate the results by comparing with experiments and numerical simulations found in the literature, and then we extend our numerical experiments to the eccentric case to observe the general behavior of the different regimes. We analyze the energy transport characterized by the relation between Nusselt and Rayleigh numbers as well as the arising flow patterns.

[1]This work was partially supported by UNAM-DGAPA-PAPIIT grant number IN115216

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Date submitted: 29 Jul 2016 Electronic form version 1.4