

Abstract Submitted
for the DFD10 Meeting of
The American Physical Society

Generation of vertical convective vortex in the transition from anomalous to normal steady-state convection ALBERT SHARIFULIN, Perm State Technical University, ANATOLY POLUDNITSIN, Perm State University — This phenomenon was discovered in the framework of experimental attempt[1] to define form of bifurcation curve in enclosed cavity with boulders temperature state of which could slowly deviate from condition of directly from bottom heating. In order to verify the discovered regularity experiment with slow cubic cell inclination form direct form bottom heat position was performed. The transition process from abnormal convection flow(When heated, and therefore more light, fluid moves down) to normal one during bifurcation curve crossing appeared to be completely unexpected and in radical contrast to served one in our 2D calculations and of other authors. The transition process appears as a fast, for 1-2 seconds, the rotation around the vertical axis of the entire mass of fluid filling the cavity. In the presentation the effect theoretical investigations results are discussed. Series of new problems concerned with the effect of existence borders definition and with possibility to control the effect through fluid properties and heat conditions is formulated Possibility of spontaneous vertical convective vortex generation application to atmospheric behavior explanation and to Earth's mantle one is discussed. [1] A.N. Sharifulin, A.N. Poludnitsin A.N., A.S. Kravchuk Laboratory Scale Simulation of Nonlocal Generation of a Tropical Cyclone. Journal of Experimental and Theoretical Physics, 2008, Vol.107, No.6, pp.1090-1093.

Albert Sharifulin
Perm State Technical University

Date submitted: 07 Aug 2010

Electronic form version 1.4