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**Analysis of the orbits of particles generating one-dimensional dynamic coherent structures** DENIS MELNIKOV, University of Brussels, DMITRI PUSHKIN, University of Oxford, VALENTINA SHEVTSOVA, University of Brussels, JEREMI COLLABORATION — The particle accumulation in time-periodic incompressible flows is studied experimentally and numerically. The geometry of interest is a cylindrical column of finite length where a liquid is suspended between two differentially heated horizontal flat disks. The increase of the temperature difference between disks beyond the critical values results in appearance of time periodic flows which are either standing or azimuthally travelling hydrothermal wave. In the case of travelling wave inertial particles have a tendency to spontaneously align in one-dimensional dynamic coherent structures called below as orbits. Three types of orbits are experimentally found in the system with polydisperse particles (differing in size, shape and density). Initial positions of different particles were close to each other. These orbits can be classified as periodic (loop PAS), quasi-periodic (toroidal PAS) and temporally synchronized orbits. Assuming the motion of particles is described by the simplified Maxey-Riley equation, the phenomenon of formation of particles accumulation structures was numerically analysed. The experimental observations are in a favourable agreement with the results of the computer simulations.

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