Abstract Submitted
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Phase transitions in a confined monolayer of magnetized beads JULIEN SCHOCKMEL, Univ de Liege — We present experimental results obtained with a model experimental system dedicated to the study of 2D phase transitions. The system is composed of millimetric beads interacting through magnetic dipole-dipole interaction. Due to the confinement, repulsive interactions tends to order the system. In addition, the system is submitted to a controlled mechanical agitation which produce an erratic motion of the beads and thus creates disorder. Controlling the competition between interaction energy and entropy, allows us to explore different structures of 2 dimensional systems. At first, the melting of a two dimensional crystal is studied. As predicted by the KTHNY theory, a two stage melting is observed, including the so-called hexatic phase (see results in Phys. Rev. E.87, 062201 (2013)). Afterward, the behavior of binary systems is studied. In particular, the effect of the grains polydispersity on the order is analyzed.

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