

Abstract Submitted  
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**Activity induced phase transition in mixtures of active and passive agents** PALLAB SINHA MAHAPATRA, AJINKYA KULKARNI, Indian Inst of Tech-Madras — Collective behaviors of self-propelling agents are ubiquitous in nature that produces interesting patterns. The objective of this study is to investigate the phase transition in mixtures of active and inert agents suspended in a liquid. A modified version of the Vicsek Model has been used (see Mahapatra et al., Physical Review E (2017), 062610), where the particles are modeled as soft disks with finite mass, confined in a square domain. The particles are required to align their local motion to their immediate neighborhood, similar to the Vicsek model. We identified the transition from disorganized thermal-like motion to an organized vortical motion. We analyzed the nature of the transition by using different order parameters. Furthermore the switching between the phases has been investigated via artificial nucleation of randomly picked active agents spanning the entire domain. Finally the motivation for this phase transition has been explained via average dissipation and the mean square displacement (MSD) of the agents.

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