

Dynamics of self-propelled particles in confined geometry

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In this work the kinetic equation for the self-propelled particle system of Vicsek model class is proposed. The mean-field approach is derived from this equation. Corresponding non-dissipative hydrodynamical equation is obtained. It shows the non-holonomic type of the motion. By considering the Couette's flow geometry the numerical evidence for the dissipation-free flow in the Vicsek model is given.