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Title:	Active Brownian Particles
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Abstract:	Using simulations, we study the theoretical models of the collective dynamics of the active particles. These particles constitute a large class of non-equilibrium systems where each individual takes energy from the environment and moves depending upon interaction with their neighboring units. We first analyzed the models of polar active particles for both constant speed and variable speed models. This class is generally characterized by two phases- ordered state and disordered state. We explore the phase diagrams using noise intensity and packing fraction as control parameters. We found that transitions occurs from the ordered to disordered state with the increase in noise intensity. We also studied self propelled soft repulsive disks in two dimensions similarly for constant speed and variable speed. These particles have excluded volume interactions and are subject to only rotational noise, but without any aligning interaction. This system shows a clustered state above a critical density and self propulsion speed. We investigate the phase diagrams under these control parameters.
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