Title:	Non-Equilibrium Phase Separation and Dynamics of Active Systems in Harmonic Trap Potential
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Abstract:	We have used theoretical models to study individual motion of active particle as well as collective dynamics and pattern formation in active particles. There are many examples of active units that you can see in biological and complex physico- chemical systems are motile cells, patterns which is localized in reaction-diffusion system, chemically powered nano-rods or macroscopic animals. So here i am using the stochastic differential equations to study the individual and collective motion of point-like active particles in harmonic trap potentials. We characterized the active system by using radial distribution and virial pressure. We performed parallel-molecular dynamic simulations on a model for active sys- tems for diferent Peclet numbers and for several system sizes. We have shown from numerical studies that this active colloidal system phase separates. Then we have also studied the dynamics of a brownian circle swimmer in a trap potential which is harmonic. I have also shown the results in different conditions like time-varying self-propulsion and harmonic tap potential and found the periodic trajectories which is stable in the absence of brownian noise and if we include noise then the trajectories become spiral and collapse into trap center.
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