

# Role of magnetic field on a Brownian particle under presence of non-conservative force field

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In this study, we investigate the role of a magnetic field when a Langevin system is in non-equilibrium driven by a torque. In equilibrium, the magnetic field does not change the probability distribution function. However, in non-equilibrium, the magnetic field influences the probability distribution function and an interesting phenomena appear. In this research, we analyze how the existence of the steady state depends on the magnetic fields and non-conservative force. From the stability analysis, we understand behavior of system. In addition, we observe violation of fluctuation-dissipation relation.