



Library Indian Institute of Science Education and Research Mohali



DSpace@IISERMohali (/jspui/)
/ Thesis & Dissertation (/jspui/handle/123456789/1)
/ Master of Science (/jspui/handle/123456789/2)
/ MS Dissertation by Int. PhD (/jspui/handle/123456789/4303)
/ MS Dissertation by MP-2018 (/jspui/handle/123456789/4313)

Please use this identifier to cite or link to this item: <http://hdl.handle.net/123456789/3912>

Title: Implementation of Langevin Model for different potentials

Authors: Lakshita (/jspui/browse?type=author&value=Lakshita)

Keywords: Langevin Model
Statistical Mechanics

Issue Date: 28-Jul-2021

Publisher: IISERM

Abstract: Equilibrium Statistical Mechanics is the study of the large systems on which statistical methods and probability theories are applied. It is concerned with the properties of the matter at the thermal equilibrium, i.e. there is no net flow of heat between the system and surroundings. It aims to derive not only the general laws of thermodynamics but also the thermodynamic functions of a given system. The real system in statistical mechanics is considered to be in various possible states, collection of which is termed as ensemble. However, the systems are subjected to time-dependent phenomena which are not in the state of thermal equilibrium. Hence, the study of Non-Equilibrium Statistical Mechanics is important to analyze the behaviour of such systems with time as a parameter. The fluctuations also play an important role in these systems. But there is a difficulty in dealing with such systems as we don't have any postulates for non-equilibrium states. A powerful approach to such non-equilibrium states and the fluctuations is stochastic differential equations which accurately model the large number of physical situations. The Langevin model is a mathematical model used to understand the dynamics of the molecular systems by writing the equations of motion for the particle in a fluid medium. In this thesis, the Langevin model is used to study the behaviour of particle in a fluid medium under different potentials. The time correlation functions and mean squared values of velocity and positions are plotted as a function time to observe how the particle is behaving at shorter and longer time scales. It is also observed whether the behaviour of the particle at longer time limits matches with that at thermal equilibrium.

URI: <http://hdl.handle.net/123456789/3912> (<http://hdl.handle.net/123456789/3912>)

Appears in MS Dissertation by MP-2018 (/jspui/handle/123456789/4313)

Collections:

Files in This Item:

File	Description	Size	Format	
Lakshita_thesis (1).pdf (/jspui/bitstream/123456789/3912/3/Lakshita_thesis%20%281%29.pdf)		1.25 MB	Adobe PDF	View/Open (/jspui/bitstream/123456789/3912/3/Lakshita_thesis%20%281%29.pdf)

Show full item record (/jspui/handle/123456789/3912?mode=full)

(/jspui/handle/123456789/3912/statistics)

Items in DSpace are protected by copyright, with all rights reserved, unless otherwise indicated.