

Statistical Methods Applied in Physics

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Statistical methods are used in statistical physics, which is a momentous interdisciplinary, to provide a conceptual link between the 'macroscopic world' and the 'microscopic world'. When studying gases, we can examine the statistical distribution of particle velocities and energies by using Maxwell-Boltzmann statistics, which can be solve as a problem of combination, to gain a comprehensive understanding of the relationship between the macroscopically observable quantities and the microscopic energies of individual particles, which make up the gas. Also, applying statistical approaches to thermodynamics can lead to deeper understanding models such as Brownian motion and provide some useful insights and general ways to deal with other physical stochastic processes. Another crucial contribution of statistics to physics is Monte Carlo method, which bases on the law of large numbers and Central Limit Theorems, has applications in a wide range of fields from computational physics, molecular dynamics and related applied fields.

Key Word: Brownian motion, Maxwell-Boltzmann statistics, Monte Carlo method, Ising model, Statistical Physics