计算物理作业 9

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破晓时分。

1 题目 1：超球体积计算

1.1 题目描述

The interior of a d-dimensional hypersphere of unit radius is defined by the condition $x_1^2 + x_2^2 + \cdots + x_d^2 \leq 1$. Write a program that finds the volume of a hypersphere using a Monte Carlo method. Test your program for $d = 2$ and $d = 3$ and then calculate the volume for $d = 4$ and $d = 5$, compare your results with the exact results.

1.2 程序描述

1.3 伪代码

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1.4 结果示例

2 题目 2：海森堡模型

2.1 题目描述

Write a MC code for a 3D Face-Centered Cubic lattice using the Heisenberg spin model (adopt periodic boundary condition). Estimate the ferromagnetic Curie temperature.

$$H = -J \sum_{\langle i,j \rangle} \vec{S}_i \cdot \vec{S}_j, \quad J = 1, \quad |\vec{S}_i| = 1$$

2.2 程序描述

2.3 伪代码

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2.4 结果示例