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*Ecole polytechnique fédérale de Zurich
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Heisenberg Model in 3D

Project for CSP course

Introduction

For this project, the objectives are to compare the Metropolis and Wolff algorithms and use the results to study the classical isotropic 3D Heisenberg model, one of the models used to model ferromagnetism in statistical physics.

Project

Compare the Metropolis and Wolff algorithms and use the results to study the classical isotropic 3D Heisenberg model, one of the models used to model ferromagnetism in statistical physics.

1. implement a performance portable version of the Metropolis and Wolff algorithm in IPPL.

2. applly the algorithms to the 3D Heisenberg model

3. benchmark time and space complexity on problems from the literatur

Contacts

- Karin Sim

Literature

[1] J D Alzate-Cardona et al. Optimal phase space sampling for Monte Carlo simulations of Heisenberg spin systems. Journal of Physics: Condensed Matter (2019)

[2] Christian Holm and Wolfhard Janke. Critical exponents of the classical three-dimensional Heisenberg model: A single-cluster monte carlo study. Physical Review B 48.2 (1993), pp. 936-950.

[3] Ulli Wolff. Collective Monte Carlo updating for spin systems. Physical Review Letters 62.4 (1989), pp. 361-364.

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