SEMPARIS – Séminaires en région parisienne

http ://string.lpthe.jussieu.fr/semparis/

Seminaire exceptionnel

Lundi 30 Septembre 2024, 11 :00
LPTMC, Jussieu, LPTMC seminar room, towers 13-12, 5th floor, room 523(https ://scipost.org/submissions/2104.13264v3/)
Domaines : cond-mat

Titre : *Collective Monte Carlo updates through tensor network renormalization*

Orateur : **Sofyan Iblisdir (Univ. Barcelona)**

Résumé : *We introduce a Metropolis-Hastings Markov chain for Boltzmann distributions of classical spin systems. It relies on approximate tensor network contractions to propose correlated collective updates at each step of the evolution. We present benchmarks for a variety of instances of the two-dimensional Ising model, including ferromagnetic, antiferromagnetic, (fully) frustrated and Edwards-Anderson spin glass cases. With modest computational effort, our Markov chain achieves sizeable acceptance rates, even in the vicinity of critical points. It compares well with other Monte Carlo schemes such as the Metropolis or Wolff algorithm : equilibration times appear to be reduced by a factor that varies between 40 and 2000, depending on the model and the observable being monitored. The scheme can be adapted to three dimensions, matrix models, or a confined gas of hard spheres.*
