Contribution ID: **42** Type: **Talk**

A novel gauge-equivariant neural network architecture for preconditioners in lattice QCD

Monday 3 November 2025 17:40 (20 minutes)

The main contribution to the cost of Lattice QCD calculations typically comes from solving the Dirac equation. Using preconditioners such as multigrid, this computational cost can be reduced significantly. We introduce a novel gauge-equivariant neural network architecture for preconditioning the Dirac equation. We study the behavior of this preconditioner as a function of topological charge and lattice volume and compare the results to multigrid. We also discuss the setup cost of multigrid and our architecture to give a fair comparison between the two.

Parallel Session (for talks only)

Algorithms and artificial intelligence

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