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Performance portable lattice gauge theory simulation with Kokkos

We provide a performance portable implementation of SU(N) lattice gauge theory (LGT) simulations using the Kokkos parallel programming model, enabling efficient execution across diverse architectures, including x86 CPUs, Arm CPUs, and GPUs. By leveraging Kokkos's abstractions for parallel execution and memory management, we map the gauge field operations of SU(N) LGT onto heterogeneous hardware while maintaining a single codebase. Preliminary benchmarks demonstrate good performance on NVIDIA V100/A100 GPUs and ARM-based processors. This work establishes a template for high performance, cross platform LGT simulations.

Significance

References

Experiment context, if any

Author: SUN, Wei

Presenter: SUN, Wei

Session Classification: Poster session with coffee break

Track Classification: Track 3: Computations in Theoretical Physics: Techniques and Methods