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Attaining multi-teraflops performance for QCD on GPUs

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In recent years, graphics processing units (GPUs) have gained prominence as general-purpose computing devices that offer an order of magnitude improvement in price/performance for a range of applications, including lattice gauge theory. In this contribution, an optimized Dirac solver for Wilson and clover-improved Wilson fermions is described. We discuss strategies for achieving high performance on a single GPU and techniques for employing many GPUs in parallel. We present illustrative results for scaling to as many as 32 GPUs on production lattices, where we achieve performance in excess of 3 Tflops at much lower cost than would be possible on traditional architectures.

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talk

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