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Multidimensional Monte Carlo integration on clusters with hybrid GPU-accelerated nodes.

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Summary: The aim of this paper is to show that the multidimensional Monte Carlo integration can be efficiently implemented on clusters with hybrid GPU-accelerated nodes using recently developed parallel versions of LCG and LFG pseudorandom number generators. We explain how to utilize multiple GPUs and all available cores of CPUs within a single node and how to extend computations on all available nodes of a cluster using MPI. The results of experiments performed on a Tesla-based GPU cluster are also presented and discussed.

Keywords: multidimensional integration; Monte Carlo methods; parallelized pseudorandom number generators; GPU clusters

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