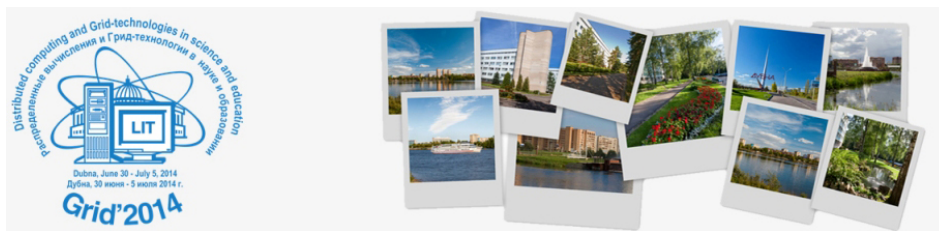


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PRAND: library of random number generators for Monte Carlo on parallel and distributed computers

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We present information on the library PRAND [1] [2] with a number of most efficient random number generators. Library can be used for the Monte Carlo simulations using parallel supercomputers, distributed computing, and hybrid computers. Effective realizations includes extensive usage of SIMD extensions of Intel and AMD processors and CUDA language for Nvidia Graphics Processing Units. Programming languages are C and Fortran. One of the useful features for using PRAND in parallel simulations is the ability to initialize up to 1019 independent streams.

We demonstrate our approach with the Monte Carlo calculation of integrals on K-100 and "Lomonosov" hybrid supercomputers effectively using up to 3000 GPUs [3].

[1] L.Yu. Barash and L.N. Shchur, PRAND: GPU accelerated parallel random number generation library: Using most reliable algorithms and applying parallelism of modern

GPUs and CPUs, Computer Physics Communications 185 (2014) 1343–1353.

[2] Л.Ю. Бараш и Л.Н. Щур, Библиотека PRAND: генерация параллельных потоков случайных чисел для расчетов Монте-Карло с использованием GPU, CUDA Альманах, март 2014, стр. 17.

[3] Л.Ю. Бараш и Л.Н. Щур, Монте-Карло, «Ломоносов» и многомерный интеграл. Суперкомпьютеры, 1 (2014) 47-49.

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