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Parallel Likelihood Function Evaluation on Heterogeneous Many-core Systems ^[1]

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This paper describes a parallel implementation that allows the evaluations of the likelihood function for data analysis methods to run cooperatively on heterogeneous computational devices (i.e. CPU and GPU) belonging to a single computational node. The implementation is able to split and balance the workload needed for the evaluation of the likelihood function in corresponding sub-workloads to be executed in parallel on each computational device. The CPU parallelization is implemented using OpenMP, while the GPU implementation is based on OpenCL. The comparison of the performance of these implementations for different configurations and different hardware systems are reported. Tests are based on a real data analysis carried out in the high energy physics community.

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Technical document file:

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