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The parallel framework for the partial wave analysis

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Partial wave analysis is crucial for extracting hadron spectra and hadron decay properties for present experiments like BES-III, COMPASS and future ones like PANDA. In the typical set-up the analysis is performed using the unbinned maximum likelihood method. For the statistics already accumulated by the BES-III experiment (about 1.225 billion J/ψ decays) and currently employed software, long data fitting time significantly complicates and sometimes restricts data analysis. With the development of new multicore CPU's and GPU's it becomes natural to use parallel programming technologies to decrease the data fitting time. For this purpose the parallel framework for partial wave analysis is being developed. In this talk the most recent software realizations will be presented. Various parallelization options were researched on several hardware architectures taking into account distinctive features of the task and external software used in the realization. The list of employed parallel computing technologies includes OpenMP, MPI, and OpenMP with Xeon Phi co-processor extensions. They were tested using resources of the heterogeneous cluster HybriLIT, their comparative performance was studied.

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