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GNA – high performance fitter for large-scale analyses.

Statistical data analysis of modern experiments deals with large-scale models with hundreds of nuisance parameters. Direct application on statistical methods such as likelihood profiling, Bayesian methods and especially Feldman-Cousins procedure can lead to extensive numerical computations.

In order to facilitate the growing need for flexible and high-performance analysis tools to deal with complex models we have developed the GNA framework. Models of experiments are defined in runtime in terms of directed acyclic graph that describes a flow of computations. Each node of the graph represents independent physical part of the model such as oscillation probability, cross section and etc. It provides transparent and flexible configuration of the models. Each node is implemented in C++ using Eigen, Boost and ROOT to achieve high performance.

The current status of the framework, overview of multithreading and GPU computing support in the framework and first results of analysis of reactor antineutrino experiments are provided in this talk.

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