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BAT - The Bayesian Analysis Toolkit

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The main goals of data analysis are to infer the parameters of models from data, to draw conclusions on the validity of models, and to compare their predictions allowing to select the most appropriate model.

The Bayesian Analysis Toolkit, BAT, is a tool developed to evaluate the posterior probability distribution for models and their parameters. It is centered around Bayes' Theorem and is realized with the use of Markov Chain Monte Carlo giving access to the full posterior probability distribution. This enables straightforward parameter estimation, limit setting and uncertainty propagation.

BAT is implemented in C++ and allows a flexible definition of models. It is interfaced to other software packaged commonly used in high-energy physics: ROOT, Minuit, RooStats and CUBA. A set of predefined models exists to cover standard statistical cases.

We will present an overview of the software and the algorithms implemented. Recent updates and future plans will be summarized.

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