

Automated Parameter Tuning of HEP Event Generators

Scientific Achievement

Developed mathematical tools for the automatic selection of observables used in event generator parameter estimation, optimization, and new comparison metrics.

Significance and Impact

Automatic parameter estimation that accounts for model deficiencies, therefore greatly reducing time and resources needed for tuning by taking the human out of the loop.

Research Details

- Event generators must be tuned to fit observations from HEP experiments, but not all observations can be fit well
- Current methods for excluding data from tunes is replaced by two-step algorithm
- Step 1: Two filtering methods as a preprocessing step to down-select “explainable” observations
- Step 2: Analyzed and compared different optimization formulations for solving the tuning problem

