

Robust Optimization for Parameter Tuning of HEP Event Generators

Scientific Achievement

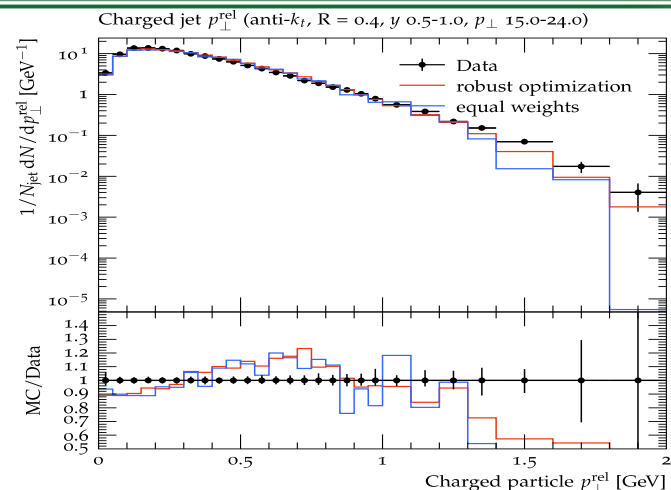
Developed robust optimization formulation to automatically tune event generator parameters and determine importance of observations.

Significance and Impact

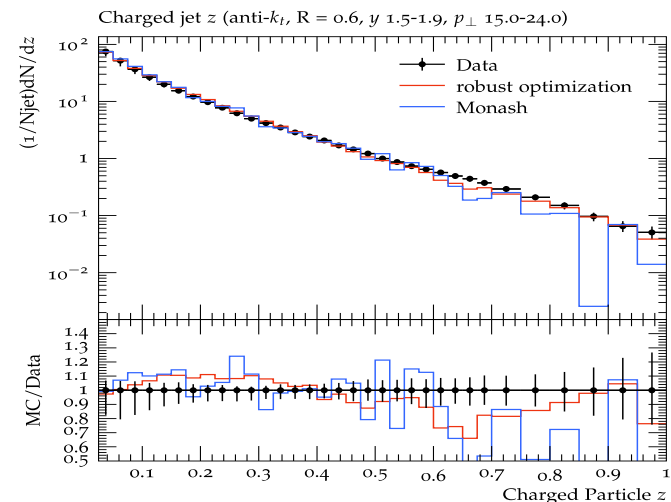
Fast optimization provides insights for domain scientists regarding parameter choices that are robust against data uncertainty.

Research Details

- Automatically determine the parameter tunes in a single-level optimization that are robust against data uncertainties
- An adjustable hyperparameter determines the proportion of observables to be included in the parameter estimation
- Easily parallelizable
- Faster and yields better results than state-of-the-art approach (scientist in the loop)



Improvement in data fit of parameter tunes from robust optimization compared to the all-weights-equal approach.



Improvement in data fit of parameter tunes from robust optimization compared to current tune ("Monash")



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