

DPF-PHENO 2024

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ARCANE Reweighting: A Solution to the Negative Weights Problem in Collider Monte Carlo

Monday 13 May 2024 16:00 (15 minutes)

In this talk, I will introduce ARCANE reweighting, a new Monte Carlo technique to solve the negative weights problem in collider event generation. We will see a demonstration of the technique in the generation of ($e^+e^- \rightarrow q\bar{q} + 1 \text{ jet}$) events under the MC@NLO formalism.

In this scenario, ARCANE can reduce the fraction of negative weights by redistributing the contributions of \mathbb{H} - and \mathbb{S} -type events a) without introducing any biases in the distribution of physical observables and b) without requiring any changes to the matching and merging prescriptions used.

I believe that the technique can be applied to other processes of interest like ($q\bar{q} \rightarrow W + \text{jets}$) and ($q\bar{q} \rightarrow t\bar{t} + \text{jets}$) as well.

Mini Symposia (Invited Talks Only)

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