Contribution ID: **4**   Type: **Poster**

Precision-Machine Learning for the Matrix Element Method

The matrix element method is the LHC inference method of choice for limited statistics, as it allows for optimal use of available information. We present a dedicated machine learning framework, based on efficient phase-space integration, a learned acceptance and transfer function. It is based on a choice of INN and diffusion networks, and a transformer to solve jet combinatorics. We showcase this setup for the CP-phase of the top Yukawa coupling in associated Higgs and single-top production.

Primary Field of Research

Particle Physics

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