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Invertible Networks for the Matrix Element Method

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The matrix element method is widely considered the perfect approach to LHC inference, but computationally expensive. We show how a combination of two conditional Invertible Neural Networks can be used to learn the transfer function between parton level and reconstructed objects, and to make integrating out the partonic phase space numerically tractable. We illustrate our approach for the CP-violating phase of the top Yukawa coupling in associated Higgs and single-top production.

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