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MEMENNTO –Matrix Element Method with Neural Networks

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The matrix element method remains a crucial tool for LHC inference in scenarios with limited event data. We enhance our neural network-based framework, now dubbed MEMENNTO, by optimizing phase-space integration techniques and introducing an acceptance function. Additionally, employing new architectures, like transformer and diffusion models, allows us to better handle complex jet combinatorics associated with initial-state radiation (ISR). These improvements are showcased again through the CP-violating phase of the top Yukawa coupling in associated Higgs and single-top production, underlining the enhanced capabilities of our revised approach.

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