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Revisiting Combinatorial Ambiguities in Dilepton t t Event Topologies with Neural Networks[1] ZHONGTIAN DONG, University of Kansas, HAIDER ALHAZMI, Jazan University, LI HUANG, University of Kansas, JEONG HAN KIM, Chungbuk National University, KYOUNGCHUL KONG, University of Kansas, DAVID SHIH, The State University of NJ Piscataway — We revisit with machine learning algorithms the combinatorial problem in SUSY-like events with two invisible particles at the LHC. As a concrete example, we illustrate our procedure with the dilepton $t\bar{t}$ events. We first reproduce results using several existing methods and compare them against performance of various machine learning algorithms. In particular, we investigate performance of attention-based network, which exploits permutation symmetry in the problem. We then consider the general case when the underlying mass spectrum is unknown, and no kinematic endpoint information is available. We demonstrate that the efficiency for selecting the correct partition is greatly improved by utilizing the machine learning techniques.

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