Machine Learning for Fast Mapping Between Parton and Reconstruction Level Jets JOHN BLUE, MICHELLE KUCHERA, Davidson College, SERGEI GLEYZER, University of Alabama, HARRISON PROSPER, Florida State University, SITONG AN, Carnegie Mellon University, ALI HARIRI, American University of Beirut, RAGHU RAMANUJAN, Davidson College, EMANUELE USAI, Brown University — In many phenomenological studies in which the full accuracy offered by the detector simulator GEANT4 is not required, faster alternatives are used in which the detector response is approximated as a parametric function. One drawback to this method is that the parametric function must be hand-coded, and should the experiment change for any reason the detector response must be re-coded. Instead of hand coding, Falcon seeks to use deep generative models to learn the detector response function. As part of the efforts of the Falcon group, conditional generative adversarial networks were used to learn the mapping from parton level jets to reconstruction level jets. Results from this model using simulated events in the Compact Muon Solenoid detector will be presented. The performance of the machine learning models will be compared with existing detector simulators.

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