Abstract Submitted
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Foundation of b-tagging applied to long-lived particles[1] GAGE ERWIN, University of Tennessee, Knoxville and Oklahoma State University, ATLAS EXPERIMENT COLLABORATION[2] — The study refers to the identification of b-jets observed by the ATLAS experiment at the Large Hadron Collider. It aims for the detection of signals due to long-lived particles from Higgs boson decays predicted by various theories beyond the standard model. The applications of this study could potentially extrapolate the b-tagging performance used on tt-bar to ZH events, allowing for uncertainties for the ZH events to be analyzed. The tt-bar events are simulations of top-anti-top quark pairs that decay into b-quarks, ideal for training algorithms. However, ZH events model the production of b quarks through the decay of Higgs-like, long-lived particles. The methods used were to apply the same techniques of b-tagging on ZH and reweighting to account for differences in kinematic dependencies. However, the ZH event has decays more displaced from the beam interaction point than the tt-bar events. To functionally make the efficiencies the same, cuts were applied to only include entries of b-hadron decay paths that are collinear with the path of the long-lived particles. In this way, the study concludes that the algorithms are not optimized for b-jets that originate far from the beam interaction point and algorithms need improvement for future studies.

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