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Observation and measurement of W emission collinear to high transverse momentum jets with the ATLAS detector

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This talk presents the observation and differential measurement of collinear W emission from jets with high transverse momentum using the ATLAS detector from pp collisions at a center-of-mass energy of 8 TeV. The measurement is performed in the muon decay channel and the cross-section is reported as a function of the distance between the muon and the closest jet, since a notable signature of this process is a W close to an energetic jet. This particular topology, made accessible by the high energies and large data sample of the LHC, has never been explicitly studied before and provides a test of theoretical QCD and electroweak models. The measured differential cross-section is compared with both multi-leg (Sherpa and Alpgen) and LO with weak showering (Pythia 8) calculations. Understanding this process is also relevant for searches for new physics that involves boosted tops, where collinear W emission may be an important background as they share a similar final state.

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