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Dark Matter Search using Semi-visible jets

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Recent studies in particle physics have shown that there are myriad possibilities for strong dark sector studies at the LHC. One signature is the case of semi-visible jets, where parton evolution includes dark sector emissions, resulting in jets overlapping with missing transverse energy. The implementation of semi-visible jets is done using the Pythia Hidden valley module to duplicate the dark sector showering. Owing to the unusual MET-along-the-jet event topology which is yet an unexplored domain within ATLAS, this search focuses on the performance and optimization challenges associated with such a unique final state, specifically looking at the small angle difference between the hardest jet and the missing transverse energy, and targeting a cut-and-count strategy.

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