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Search for Dark Matter in a Monotop Setup at the LHC

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The Standard Model can be considered an approximation at a lower energy of a more fundamental theory which encourages the search for new physics. One evidence supporting that new particles beyond the SM might exist comes from astrophysical measurements that point to the existence of a kind of matter that does not interact with the electromagnetic force, usually referred to as Dark Matter (DM). Although the particles associated with this DM are not expected to interact significantly with detectors, the proton-proton collisions at the Large Hadron Collider (LHC) can produce new particles that couple both to DM candidate particles and to SM particles allowing the detection of these processes. The monotop setup searches for events with one top quark and large missing transverse energy from the DM candidates. The purpose is to present a detailed study on the search for DM in a monotop setup and also contribute to the analysis being done by the ATLAS experiment at the LHC.

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