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Searching for dark matter with the ATLAS detector using unconventional signatures

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The Standard Model (SM) can be considered an effective low-energy expression of a more fundamental theory. Several observed phenomena cannot be explained by the SM, the existence of dark matter (DM) being one of them.

At the Large Hadron Collider (LHC), protons can stay intact after the interaction and be scattered by very small angles, which are then detected by the ATLAS Forward Proton tagging detectors (AFP), effectively converting the LHC into a photon-photon collider.

The search for DM can be done by targeting signatures in which pairs of soft leptons plus missing mass are produced in association with scattered protons tagged using AFP.

A model-independent search using this lepton+X signature is being conducted.

Which topic best fits your talk?

High Energy Physics and Cosmology

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