

Search for Dark Matter Produced in Association with a Dark Sector Higgs Boson in Proton-Proton Collisions with the ATLAS Detector

Tuesday, 9 February 2021 16:15 (15)

Longstanding evidence from observational astronomy indicates that non-luminous “dark matter” constitutes the majority of all matter in the universe, yet this mysterious form of matter continues to elude experimental detection. The study presented in this talk is part of an ongoing programme to search for dark matter production in high-energy proton-proton collisions at the Large Hadron Collider (LHC) at CERN. This search targets a model in which dark matter is produced in association with the emission of a hypothesized heavy Higgs boson in the dark sector, which then decays to a pair of W bosons. The final-state signature of this model would be an excess of missing transverse energy in the detector due to undetected dark matter production, along with two reconstructed W bosons. A search was recently performed targeting this final state in the ‘hadronic’ decay channel, wherein both W bosons decay to a pair of quarks. The semi-leptonic WW decay channel, in which one of the bosons instead decays to a lepton and neutrino, is expected to complement and extend the reach of the existing search in the hadronic channel. Ongoing work towards developing a dark matter search in this semi-leptonic WW decay channel is presented.

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Please select: Experiment or Theory

Experiment

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