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Search for resonant production of strongly-coupled dark matter in proton-proton collisions

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A collider search for semi-visible jet final state arising from dark matter, using Run 2 data recorded with the ATLAS detector at the CERN LHC with a center-of-mass energy of 13 TeV is presented. For this search the hidden sector is hypothesized to couple to the standard model via a heavy leptophobic Z' mediator. Semi-visible jets are an unusual final state, where the visible states in the shower are standard model hadrons and the strongly coupled hidden sector contains dark quarks which result in dark hadrons. This gives a final state consisting of a jet aligned with missing energy due a mixture of stable, invisible dark hadrons and visible hadrons from an unstable subset of dark hadrons that promptly decay to SM particles. The resonant production and decay of such a mediator will result in a dijet system of semi-visible jets, leading to missing energy aligned with one of the jets, a signature ignored by most dark matter searches.

Apply to be considered for a student ; award (Yes / No)?

Yes

Level for award;(Hons, MSc, PhD, N/A)?

MSc

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