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Dark mediator in four top search at the LHC[1] ABIGAIL WARDEN, University of Missouri-Columbia, MATTHEW BUCKLEY, Rutgers University — Dark matter consists of about 26% of the known universe and yet its properties cannot be described by the Standard Model. We hypothesize in a new physics model that top quarks can decay to dark matter by an unknown mediator particle. My project seeks to understand this mediator particle by setting limits to the coupling factor, the strength of its interaction to the top quark. Assuming the mediator particle would intermittently decay back to top quarks, this would give results we can detect at the Large Hadron Collider. Therefore, I simulated a completed CMS multi-lepton search experiment in which four top quarks were produced. After validating my simulated results to CMSs, the new physics model was tested using the same simulated search and further calculations gave an upper limit of 3.42 for the coupling factor. More data with events producing four top quarks would possibly lower this limit and thus indicate stronger theoretical phenomena.

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Abigail Warden
University of Missouri-Columbia

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