An Unfolded Search for Dark Matter in Vector Boson Fusion- and Monojet-Topologies with the ATLAS Experiment

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Traditional searches for Dark Matter with the ATLAS detector at the LHC usually share a common strategy and a common limitation: setting limits based on the number events observed with a specific detector makes it difficult to compare the results to new beyond the Standard Model theories. This talk introduces a new search for Dark Matter performed by the ATLAS experiment that measures a ratio of cross-sections and provides detector-corrected ("unfolded") differential distributions in two different phase spaces. These phase spaces are events with at least one jet and missing transverse momentum (MET), sensitive to a large number of WIMP models, and events with at least two jets and MET. This latter phase space is especially sensitive to Dark Matter produced in association with weak boson fusion, that has yet to be studied in great detail. I will discuss the approach of this analysis and its novelties (ratio, unfolding), and why it increases the reach and longevity of the search, show the results and put them into context with other collider searches for Dark Matter.