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Dark matter searches with a focus on new techniques (Mono-X)

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The quest to understand the nature of Dark Matter has never been so exciting. Vast improvements in direct detection sensitivity combined with tantalizing hints from astrophysical data have lead some to dub the 2010's as the "Dark Matter Decade". Today collider based experiments, such as ATLAS and CMS, offer a new vantage point in the search for non-gravitational dark matter interactions. If Dark Matter interacts weakly with the Standard Model it can be produced at the LHC and identified via the initial state radiation (ISR) of the incoming partons. The signature left in the detector is that of the ISR particle (jet, photon, Z or W) recoiling off of the invisible Dark Matter particles, which is manifest as a large momentum imbalance. Such collider based searches can be interpreted in terms of a higher dimensional effective field theory to place limits in the same parameter space as the direct detection and space-based experiments.

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