Sniffing Out Dark Matter at the LHC

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Abstract: With observed galactic excesses, tighter constraints from underground experiments, and a precise measurement of the relic density, our understanding of dark matter has greatly improved. As the only source that can potentially produce heavy dark matter, the LHC has the capability of complementing existing measurements. However, the LHC faces serious challenges in the next years of operation. The large intensities and high particle density demand new approaches to resolving particle collisions. In this talk, we present a new kind of “QCD-imaging,” PUPPI, which enhances the resolution of reconstructed particles in the LHC and largely overcomes the difficulties of high intensity running. In conjunction with a deeper understanding of hadronic structures, I will show these developments can establish a new paradigm in dark matter measurements.