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Dark matter searches at colliders

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The nature of dark matter, one of the most compelling open questions in fundamental physics, is still unknown. A comprehensive search program has developed over the past decades, spanning direct detection experiments, indirect detection via astrophysical signals, and collider-based production. In this talk, we focus on collider searches for dark matter, particularly at the Large Hadron Collider, and discuss how these efforts complement other detection approaches. We will touch upon the theoretical frameworks commonly used to interpret collider results, and highlight recent results and constraints, where initial emphasis on mono-X searches and invisible Higgs decays have over the past years been extended to include long-lived particle searches, light mediators or non-minimal dark sectors. We will conclude with future prospects for collider-based dark matter detection, and how these integrate into a global, multi-pronged strategy to uncover the particle nature of dark matter.

Collaboration you are representing

CMS and ATLAS

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