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Tumblers: A Novel Signal for Dark Matter and Its Discovery Prospects at Colliders

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In this paper, we point out a novel signature of physics beyond the Standard Model which could potentially be observed both at the High-Luminosity LHC (HL-LHC) and at future colliders. We call such a signature a "tumbler." In this talk, I discuss the prospects for observing tumbler signatures at the HL-LHC, taking into account the enhanced timing capabilities afforded by the upgraded LHC detectors. We not only find that a statistically significant number of tumbler events could potentially be observed at the HL-LHC, but also find that meaningful measurements of the masses and couplings of the dark particles involved can be obtained from a reasonably small sample of such events.

Summary

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