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The importance of shielded transverse detectors for BSM physics with long-lived particles

The observation of the decay in flight of exotic long-lived particles with $c\tau > \mathcal{O}(1 \text{ m})$ would be a compelling signature for many Beyond Standard Model (BSM) scenarios. The sensitivity to such particles of existing LHC experiments, however, is limited by complicated trigger environments, high backgrounds, and/or geometric restrictions to the forward region, leaving a significant region of phase-space unexplored. A dedicated, shielded, transverse experiment is therefore essential to search for many BSM scenarios above the electroweak scale at the high-luminosity LHC (HL-LHC).

We here briefly present the physics case for a dedicated, transverse, zero-background long-lived particle detector at the HL-LHC.

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