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Long-Lived Particles at the FCC-ee

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Many physics problems such as neutrino masses and the nature of dark matter predict particles with long lifetimes as an important possibility in the search for new phenomena. When produced at colliders, these long-lived particles (LLPs) have a distinct experimental signature: they can decay far from the collision point, or even completely pass through a detector before decaying. Since most of the trigger and reconstruction algorithms are optimized for short-lived particles, searches for LLPs can be challenging, usually requiring dedicated methods and sometimes also dedicated hardware to spot them. In the context of FCC-ee, crucial physics cases connected to LLPs will collect very high statistics in very clean experimental conditions. In this presentation, I will consider the high luminosity Z run and highlight three interesting physics cases that can produce LLPs at the FCC-ee: Heavy Neutral Leptons, Axion-Like Particles, and exotic Higgs boson decays.

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