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Search for Long Lived Particles with Innovative Tracking Algorithm in the ATLAS Experiment

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New Long-lived particles (LLPs) - ones that could travel long distances before decaying- are among numerous exotic signatures that would help address the universe's biggest mysteries such as Dark Matter. Many Beyond the Standard Model theories that aim to address the limitations of the standard model point to the Higgs boson as a possible portal to new physics, where the Higgs successively may decay to LLPs. The ATLAS analysis software has undergone significant improvement ahead of Run-3, in particular, Large Radius Tracking (LRT). LRT is a dedicated track reconstruction algorithm that aims at efficiently reconstructing the displaced charged particles produced in LLP decays. In this talk, we will discuss the expected performance of LRT for Run 3 data taking and highlight the significantly improved sensitivity for LLP searches due to the new LRT using the example of a search of LLPs via Higgs boson production in association with the Z boson.

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Please select: Experiment or Theory

Experiment

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