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# Direct detection of charged long-lived particles at a future 10 TeV Muon Collider

A future 10 TeV muon collider presents fantastic opportunities to search for new fundamental particles. This study focuses on the direct detection of charged long-lived particles (LLPs) by identifying tracks that are more slowly moving than those of Standard Model particles. However, beam-induced background (BIB) from muon decays presents a challenge for accurately reconstructing tracks and serves as a potential source of out-of-time background. Presented here is a study of long-lived staus in the context of a simplified GMSB model with the stau as the NLSP. Analysis of staus of varying mass and lifetime gives insight into which constraints may be imposed on timing windows for hit acceptance to reject BIB while maintaining high efficiency for LLPs.

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