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Signatures of Long-lived Exotic Particles at Colliders

The search for stable exotic hadrons is a promising way to observe new physics processes at collider experiments. For example, R-hadrons are predicted in a number of supersymmetry scenarios such as split-supersymmetry and gauge-mediated supersymmetry breaking. The discovery potential for such particles can be enhanced or severely suppressed by their interactions with matter as they pass through a detector. This talk describes the predictions of a Geant-4-implemented Regge-based model for the interactions in matter of stable hadrons containing a long-lived exotic parton which can have a range of colour and electric charges. Comparisons are made with a generic scattering model, and the implications of this work on future searches at the LHC are discussed. Furthermore, previously obtained limits from collider experiments are revisited and discussed in the light of this work.

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