

Displaced vertices and material map in ATLAS

A key observable for new physics at the Large Hadron Collider is the displaced vertex signature. Heavy and hitherto unseen particles can be produced and travel a short distance prior to decaying into Standard Model particles. A search for a such signature associated with a muon and charged particles from the ATLAS collaboration is shown in this poster. The search is based on a data sample of proton-proton collisions at a centre-of-mass energy of 13 TeV, corresponding to an integrated luminosity 136 fb^{-1} . The observed event yields are compatible with those expected from background processes. The results are presented as limits at 95% confidence level on model-independent cross sections for processes beyond the Standard Model, and interpreted as exclusion limits on scenarios with pair-production of long-lived top squarks that decay via a small R-parity-violating coupling to a quark and a muon. A key background to the search arises from interactions of particles from the proton-proton collision with detector and accelerator-related material. The poster also includes details of a study undertaken to estimate and minimise this background.

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Session Classification: Thu morning session 2