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Search for EWKino production and long-lived particles at the LHC

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The Large Hadron Collider has extended the reach of particle-physics experiments with a potential for discovery of new physics at the TeV scale. Many models of physics beyond the Standard Model predict new particles with long lifetimes. Examples include supersymmetry with R-parity violation, suppressed decays of the next-to-lightest supersymmetric particle, or models with hidden sectors. The decay vertices of particles with lifetimes of order 10 ps to 10 ns can be efficiently identified by the ATLAS and CMS detectors.

In addition, in quark and gluons collisions it is easy to produce coloured objects like gluinos and squarks, which decay typically to jets and missing energy (MET), while the cross section for Electroweak production is smaller. These “ewkino” decays typically produce many

leptons and MET. The searches for these decays are generally based directly or indirectly on MET analysis.

A review of the search for such particles, including methods for reconstruction and background suppression and the expected sensitivity of the search using 2012 data collected by LHC is reported.

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