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SUSY searches at √s = 13 TeV with two same-sign leptons or three leptons, jets and ETmiss at the ATLAS detector - Background estimation and latest analysis results.

Supersymmetry (SUSY) is one of the most studied theories to extend the Standard Model (SM) beyond the electroweak scale. If R-parity is conserved, SUSY particles are produced in pairs and the lightest supersymmetric particle (LSP), which is typically the lightest neutrino chi_0ˆ1, is stable. In many models the LSP can be a suitable candidate for dark matter. This poster presents a search for supersymmetric phenomena in final states with two leptons (electrons or muons) of the same electric charge or three leptons, jets and missing transverse energy. While the same-sign or three leptons signature is present in many SUSY scenarios, SM processes leading to such events have very small cross-sections. Therefore, this analysis benefits from a small SM background in the signal regions leading to a good sensitivity especially in SUSY scenarios with compressed mass spectra or in which the R-parity is not conserved. Except from the prompt production of same-sign lepton pairs or three leptons, the main sources for SM processes contami- nating the signal regions are fake or non-prompt leptons and electrons with mis-identified charge. While backgrounds originating from prompt lepton sources are estimated with simulated Monte Carlo events, the contribution from other sources is evaluated with data-driven techniques. In the ongoing Run 2, the search was performed with the full dataset recorded with the ATLAS detector during the year 2015 and 2016 corresponding to a total integrated luminosity of 36.1 fb −1. This poster will show the latest results interpreted in several simplified supersymmetric models featuring R-parity conservation and R-parity violation.

Experimental Collaboration

ATLAS

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