

Search for higgsinos with compressed spectra exploiting a low-momentum track with large transverse impact parameter

Thursday 18 July 2024 20:40 (20 minutes)

Supersymmetry (SUSY) models with nearly mass-degenerate higgsinos could solve the hierarchy problem as well as offer a suitable dark matter candidate consistent with the observed thermal-relic dark matter density. However, the detection of SUSY higgsinos at the LHC remains challenging especially if their mass-splitting is $O(1 \text{ GeV})$ or lower. A novel search using 140 fb^{-1} of proton-proton collision data collected by the ATLAS Detector at a center-of-mass energy $\sqrt{s}=13 \text{ TeV}$ and targeting final states with an energetic jet, missing transverse momentum, and a low-momentum track with large transverse impact parameter is developed to face such challenge. Results are interpreted in terms of SUSY simplified models and, for the first time since the LEP era, a range of mass-splittings between the lightest charged and neutral higgsinos from 0.3 GeV to 0.9 GeV is excluded up to 170 GeV of higgsino mass.

I read the instructions above

Yes

Alternate track

1. Higgs Physics

Authors: SALA, Alessandro (Università degli Studi e INFN Milano (IT)); DELIOT, Frederic (Université Paris-Saclay (FR))

Presenter: SALA, Alessandro (Università degli Studi e INFN Milano (IT))

Session Classification: Poster Session 1

Track Classification: 03. Beyond the Standard Model