

Table of Contents

Search for chargino and stop (2LOS) with Run2 data.....	1
Comments from 27 November 2020 presentation (Link to the slides in Indico):.....	1

Search for chargino and stop (2LOS) with Run2 data

Comments from 27 November 2020 presentation ([Link to the slides in Indico](#)):

The content in the AN-19-256 referred to in the following answers has been implemented in v2.

- Which triggers are used in the analysis?
 - ◆ Tables summarizing the trigger paths used in the analysis have been included in the Appendix B of AN-19-256.
- Same-sign control region (slide 12): would it be possible to include this control region in the fit and let it decide the value of the scale factors for the rate of nonprompt leptons?
 - ◆ This is not of easy implementation as the nonprompt lepton scale factors affect a component of each background rather than a specific background as a whole. As a first approach, we evaluate the impact of the nonprompt scale factors by repeating the fit using a non-prompt SF = 1 +/- measured deviation in the same-sign control region. The test is done for the T2tt and the TChipmSlepSnu models. In each plot, the black line shows the (blinded) exclusion region obtained from the new fit, while the red one shows the original result obtained by setting the nonprompt SF to the value measured in the same-sign control region. Given the very small impact of the nonprompt lepton SFs to the fit, we think that the integration of the same-sign control regions in the fit would be an overkill.
- Drell-Yan mismodeling in 2017 (slide 17): what is the contribution of this background to the search regions? How much does its mismodeling affect the fit?
 - ◆ The yields for Drell-Yan production and other background processes in the search regions are compared in Section 7 of AN-19-256. For 2017 (page 32), Drell-Yan production is one of the main contributors in the lower $p_{T\text{miss}}$ regions and m_{T2} bins, becoming increasingly less relevant at higher $p_{T\text{miss}}$ and m_{T2} values.
 - ◆ To evaluate the impact of the 2017 Drell-Yan mismodeling, we repeat the fit by using Drell-Yan estimates before JER smearing. No significant change is found in the (blinded) exclusion regions neither for the T2tt or the TChipmSlepSnu models (as before, black lines refer to the new fit with no JER smearing for the Drell-Yan background, while red lines refer to the original fit).
- For the normalization of WZ, ZZ, and ttZ production, you measure global scale factors in suitable control regions with $p_{T\text{miss}} > 160$ GeV and use them in all the search regions (slides 14 to 16). Is there any dependence of these scale factors on the $p_{T\text{miss}}$ and jet multiplicity bins used to define the search regions?
 - ◆ We compare observed and expected yields as a function of $p_{T\text{miss}}$ and jet multiplicity in the control regions used to study the WZ, ZZ, and ttZ backgrounds in Sections 5.2.1, 5.2.2, and 5.2.3 of AN-19-256, respectively. No significant trend is observed.
 - ◆ We modify the fit used to extract the signal in our analysis, by adding the WZ, ZZ, and ttZ control regions to it, and letting the fit itself to determine the normalization of these processes in each $p_{T\text{miss}}$ and jet multiplicity bin (for ttZ production, only $p_{T\text{miss}}$ bins are considered, as the corresponding control region is defined by requiring at least one b-tagged jet; this process

SUSYStopCharginoDileptonIntermediateRun2 < Sandbox < TWiki

is anyway relevant only in search regions with b-tagged jets). The new approach yields very similar (blinded) exclusion regions for the T2tt and the TChipmSlepSnu models (as before, black lines refer to the new fit with WZ, ZZ, and ttZ control regions, while red lines refer to the original fit).

-- PabloMatorrasCuevas - 2020-12-14

This topic: Sandbox > SUSYStopCharginoDileptonIntermediateRun2

Topic revision: r9 - 2021-07-29 - LucaScodellaro



Copyright &© 2008-2021 by the contributing authors. All material on this collaboration platform is the property of the contributing authors.

or Ideas, requests, problems regarding TWiki? use [Discourse](#) or [Send feedback](#)