

Searching for top SUSY partners at compressed regions

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Light top superpartners play a key role in stabilizing the electroweak scale in supersymmetric theories. For R-parity conserved supersymmetric theories, traditional searches are not sensitive to the compressed region $m_{\tilde{t}} \approx m_{\chi} + m_t$ and $m_{\tilde{t}} \approx m_{\chi} + m_W + m_b$, where χ is the neutralino. In this talk, I will introduce a new observable R_M whose distribution has a peak at these regions. The position of the peak is strongly related to the mass of the top partner. With this property, I will show that a new multi-jets plus missingET analysis can close the gaps at these compressed regions. In particular, using the LHC with a center of mass energy of 13 TeV and a luminosity of 3000 fb^{-1} , the gap at $m_{\tilde{t}} \approx m_{\chi} + m_t$ can be closed up to $m_{\tilde{t}} \approx 800 \text{ GeV}$.

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