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Searching for Bino-Stop Coannihilation Region in Open Data with Displaced Tracks (12'+3')

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Light top quark superpartners are the key ingredients for supersymmetric models to solve the electroweak hierarchy problem. The compressed region of the parameter space that $m_{\tilde{t}_1} \approx m_{\chi_1^0}$ is notoriously difficult to search. In this region, if the LSP neutralino is pure bino, $\tilde{t}_1$ can be long-lived, which produces displaced vertices in detectors. We propose to use the monojet trigger plus the analysis of displaced vertices to cover this region. We apply this method to the 8 TeV CMS Open Data with a luminosity of 11.6˜fb^{-1}, and find that using this method the 2σ limit of $m_{\tilde{t}}$ in the region $m_{\tilde{t}} - m_{\chi^0} \approx 15 - 30$ GeV is about $m_{\tilde{t}} > 350$ GeV.

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