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Probing Compressed Top Squarks at the LHC at 14 TeV SEAN WU, BHASKAR DUTTA, WILL FLANAGAN, Department of Physics and Astronomy, Texas A&M University, ALFREDO GURROLA, WILL JOHNS, Department of Physics and Astronomy, Vanderbilt University, TERUKI KAMON, Department of Physics and Astronomy, Texas A&M University, PAUL SHELDON, Department of Physics and Astronomy, Vanderbilt University, KUVER SINHA, Department of Physics, Syracuse University, KECHEN WANG, Department of Physics and Astronomy, Texas A&M University — A feasibility study is presented for the search of the lightest top squark (t) in a compressed scenario, where its mass is approximately equal to the sum of the masses of the top quark and the lightest neutralino $\tilde{\chi}_1^0$ and there exists no limit from the current 8-TeV data or from the 14-TeV projections. The study is performed in the final state of two b-jets, one lepton, large missing transverse energy, and two energetic jets with a large separation in pseudo-rapidity, in opposite hemispheres, and with large dijet mass. The analysis shows that the LHC could probe compressed top squarks mass ~ 300 GeV with an integrated luminosity of 300 fb^{-1} for two (t+$\tilde{\chi}_1^0$) and three body (b+W+$\tilde{\chi}_1^0$) final states arising from the stop decay at 5σ significance with no systematic uncertainty. After including the systematics, the significance for $m_{st} = 200$ GeV and $\Delta M = 7$ GeV is expected to be $6(3)\sigma$ for 300 fb^{-1} luminosity with 3(5)% systematic uncertainty, while the significance becomes $4(2)\sigma$ for the same top squark mass with $\Delta M = -7$ GeV.

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