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Probing 23% of the Universe at the Large Hadron Collider ALFREDO GURROLA, RICHARD ARNOWITT, BHASKAR DUTTA, TERUKI KAMON, ABRAM KRISLOCK, DAVE TOBACK, Texas A&M University — With recent astronomical measurements, we know that 23% of the Universe is accounted by a mysterious dark matter. The results have constrained the parameter space of supersymmetry (SUSY), which is a leading theory that could connect cosmology and particle physics and offers an explanation of the dark matter. A characteristic prediction from the parameter space is that the supersymmetric tau lepton and the lightest neutralino are nearly mass degenerate (mass difference of $\sim 5-15$ GeV) and can be created at the Large Hadron Collider (LHC). We present a methodology to extracting the dark matter signals at the LHC, and show the accuracy to which we can measure the dark matter relic density and the SUSY parameters.

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