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Exploring the Natural Anomaly-Mediated Supersymmetry Breaing Landscape at the HL-LHC

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Natural anomaly-mediated Supersymmetry breaking (nAMSB) models arise from modifications to anomaly-mediated SUSY breaking models to avoid conflicts created by bounds from the Higgs mass, constraints from searches for wino-like WIMPS, and bounds from naturalness. nAMSB models still feature the wino as the lightest gaugino, but the higgsinos become the lightest EWinos. In nAMSB models with soft SUSY breaking in a sequestered sector, the Higgs mass is maintained at $m_h \sim 125$ GeV, and sparticle masses fall within the LHC bounds. We explore model lines over the gravitino mass $m_{3/2}$ and find that the lower bound is excluded by gluino pair searches while the upper parameter space is excluded by gaugino pair searches. The middle range of $m_{3/2} \sim 90 - 200$ TeV is expected to be fully testable at the HL-LHC with the following discovery channels: soft dilepton and trilepton from higgsino pair production, same sign diboson production, trilepton from wino pair production, and top squark pair production.

Mini Symposia (Invited Talks Only)

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