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Supersymmetry discovery potential in future LHC and HL-LHC running with the CMS detector AHMAD BORZOU, Baylor Univ, CMS COLLABORATION — The search for supersymmetry (SUSY) is a major goal of the LHC physics program. The number of SUSY scenarios is large, and both high luminosity data samples and the full set of CMS detector capabilities are required to provide sensitivity to the broad range of signatures, cross sections, and decay branching fractions that can arise. If evidence for a spectrum of new particles is discovered, an extensive program of measurements will be required to determine its properties. In this talk, results are presented from a set of studies that address key questions related to the anticipated program of SUSY searches, assuming integrated luminosities from 300 fb^{-1} (LHC Run 2+3) to 3000 fb^{-1} (High Luminosity LHC). Three full-spectrum natural SUSY scenarios are considered in detail, as well as two compressed mass spectra. Using these complementary approaches, results are presented on the sensitivities of measurements with a varying number of jets, b-tagged jets, and leptons, and with a variety of different kinematic variables. These studies, together with results from previous investigations, demonstrate the tremendous potential for discovering and elucidating SUSY with the CMS detector in future LHC running.

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