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Prospects for testing the light Higgsino/Singlino scenario of the NMSSM

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Light neutralinos/charginos are an attractive scenario in the NMSSM: The relic density of Dark matter is easily in the WMAP/Planck range, bounds from direct detection are easily satisfied, and fine-tuning is alleviated. The most promising search channels at the LHC are three leptons plus MET. (Possible are one lepton + Higgs + MET and/or four leptons + MET.) Scanning the parameter space of the NMSSM consistent with astrophysical bounds one finds that NO region in the M_LSP - M_chargino mass plane is ruled out after the run I, and only a very small region might be tested at the run II. The reasons are the smaller production cross sections and the reduced (mixed) branching fractions into the most promising final states.

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