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Muon and b-tagging performance optimization for the search for neutral MSSM higgs bosons with the ATLAS detector

— •Alessandro Manfredini, Johanna Bronner, Sandra Kortner, Rikard Sandstroem, Sebastian Stern, and Daniele Zanzi — Max-Planck-Institut für Physik, München

The minimal supersymmetric extension of the standard model (MSSM) predicts the existence of five Higgs bosons (h, H, A, H^+, H^-) whose properties are at the tree level determined by two independent parameters, the ratio $\tan\beta$ of the two vacuum expectation values and the mass m_A of the pseudoscalar Higgs boson A. For large values of $\tan\beta$ the neutral MSSM Higgs bosons are predominantely produced in association with b-quarks. The b-jets originating from these processes have a relatively low energy (below 20 GeV) compared to those in $t\bar{t}$, the dominant background. This talk introduces methods to optimize the measurement of the b-tagging performance in this challenging low-pT regime. As the most promising final states for the search are defined by the Higgs decays into tau or muon pairs, another important aspect studied for this analysis is the lepton isolation in a high pile-up environment.

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Email:	**manfredi@mppmu.mpg.de**