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NMSSM Higgs Boson Production with Tagged Protons

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The simplest supersymmetric model that solves the
mu-problem and in which the GUT-scale parameters need not be finely
tuned in order to predict the correct value of the Z boson mass is
the Next-to-Minimal Supersymmetric Standard Model (NMSSM). However,
in order that fine-tuning be absent, the lightest CP-even Higgs
boson h should have mass around 100 GeV and SM couplings to gauge
bosons and fermions. The only way that this can be consistent with
LEP limits is if h decays primarily to four tau particles.
Interestingly, this scenario is natural in the NMSSM. Detection of
any of the NMSSM Higgs bosons at the LHC in this preferred scenario
will be very challenging using conventional channels. We demonstrate
that the four-tau decay mode should be visible if the Higgs is
produced in the process pp -> p+h+p with the final state protons
being measured using suitably installed forward detectors.

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