

Abstract Submitted
for the APR09 Meeting of
The American Physical Society

Search for a NMSSM $h \rightarrow aa \rightarrow \mu\mu\mu\mu$ at the LHC SERGEY SENKIN, JAMES PIVARSKI, Texas A&M University, ALEXANDER BELYAEV, Heriot-Watt University, ALEXEI SAFONOV, Texas A&M University — We investigate the feasibility of a search for a Next-to-MSSM Higgs boson (h) decaying to two light pseudoscalars (a) followed by the decay of the pseudoscalar to four muons. The NMSSM scenario escapes the stringent experimental limit on low Higgs mass by providing new decay modes, thereby lowering branching fractions relative to the conventional search channels. The analysis proposed in this contribution is sensitive to NMSSM Higgs production with the mass of the pseudoscalar in the range below twice the tau mass, even for relatively low integrated luminosity. The advantage of the four-muon mode is low background in the final state, which allows us to use Higgs bosons produced in gluon fusion, the dominant production mechanism at the LHC. We describe the analysis and calculate the amount of data needed for discovery and achievable exclusion limits in the case of no signal.

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Date submitted: 07 Jan 2009

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