

Prospects for observing CP violating Higgs at Tevatron and LHC

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We analyze the prospect for observing the intermediate neutral Higgs (h_2) boson in its decay to two lighter Higgs bosons (h_1) at the Hadron Colliders in the framework of the CP violating MSSM using the PYTHIA event generator. We consider the lepton+ 4-jets+ missing energy channel from $p\bar{p}$ $raWh_2$ $raWh_1h_1$ $ral\nu_l b\bar{b}b\bar{b}$, with two or three tagged b -jets. We treated c -jets separately from other light flavor jets and employed the mis-tagging criterion. We explicitly considered all possible Standard Model backgrounds. We found that it is very hard to observe this signature in the LEP-allowed region of parameter space, even though the background is manageable, due to the small signal efficiency at Tevatron. By applying judiciously kinematical selections, we suppressed huge backgrounds and left with a few ten signal events at LHC. Requiring m_{h_2} $lsim 140$ GeV leads the total background comparable to signal. Our analysis show that the Higgs signal at LHC might be show up over the backgrounds in the vicinity of present LEP exclusion.

Primary authors: Prof. DREES, Manuel (PI, University of Bonn); Dr DAS, Siba Prasad (AHEP,IFIC, University of Valencia)

Presenter: Dr DAS, Siba Prasad (AHEP,IFIC, University of Valencia)

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