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Title:	Searching for a heavy Higgs boson in a Higgs-portal B-L model
Authors:	Mitra, Manimala (/jspui/browse?type=author&value=Mitra%2C+Manimala)
Keywords:	heavy Higgs boson Hadron Collider's high luminosity runs (HL-LHC) Higgs-portal B-L model
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Abstract:	We study the discovery prospects of a heavy neutral scalar arising from a U(1)B-L extension of the Standard Model (SM) during the Large Hadron Collider's high luminosity runs (HL-LHC). This heavy neutral scalar mixes with the SM Higgs boson through a Higgs portal and interacts with the SM particles with an interaction strength proportional to the sine of the mixing angle. The mixing between the two Higgs bosons is constrained by direct and indirect measurements. We choose an experimentally viable mixing angle and explore in detail the ZZ and WW decay modes of the heavy Higgs boson. For the ZZ case, we focus on the cleanest 4 and 2 γ final states and find that a heavy Higgs boson of mass smaller than 500 GeV can be discovered at the HL-LHC. For the WW decay mode, we analyze the jjET signature. We implement novel background reduction techniques in order to tackle the huge background by performing both cut-based and multivariate analyses. However, large backgrounds render this channel challenging. We briefly discuss the discovery prospects of the heavy Z'-boson arising in this model.
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