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Searches for heavy Higgs bosons in the framework of 2HDM model

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Difficulties associated with the multiplicity of particle production in proton collisions at the LHC and with theoretical description of hadronization lead to assumptions about a new physics in studying the angles of escape and energy of jets. Problems of such physics are connected with the vacuum properties related to the hierarchy problem. The explanation of difficulties of Standard Model (SM) is realized within the theories beyond SM, one of which is Supersymmetry (SUSY). The most promising SUSY model is 2-Higgs-Doublet Model (2HDM) [1]. In the framework of 2HDM model we presented the searches for heavy neutral and charged Higgs bosons, which are performed through the calculations of production cross sections using MadGraph5aMC@NLO program [2] with ansatz of Yukawa coupling and the restricted parameter space connected with LHC Run 2 data [3, 4]. The searches for heavy resonances are performed over the mass range 0.1–1 TeV for the $pp \to At\bar{b}$, $pp \to H^+b\bar{t}$, $pp \to H^+t\bar{t}$, $pp \to HHZ$ decay modes. The presented data demonstrate the jump in the production cross section of $H^+b\bar{t}$ and HHZ production processes in the mass range of 100-200 GeV and 100-300 GeV accordingly at energy of 14 TeV.

References:

1. G. Branco et al., Physics Reports **516**, 1 (2012).
2. J. Alwall et al., JHEP **07**, 079 (2014).
3. P. Sanyal, Eur. Phys. J. C **79**, 913 (2019).
4. K. Babu and S.Jana, JHEP **02**, 193 (2019).

Primary authors: Dr OBIKHOD, Tetiana (Institute for Nuclear Research NAS of Ukraine); Mr PETRENKO, Ievgenii (Institute for Nuclear Research NAS of Ukraine)

Presenter: Dr OBIKHOD, Tetiana (Institute for Nuclear Research NAS of Ukraine)

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