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A multivariate selection of charmless B+ decays to three mesons in LHCb detector

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The analysis of charmless decays $B^{\pm} \to h_1^{\pm} h_2^{+} h_3^{-}$, where h_i are pions or kaons, collected by LHCb in Run I, show strong evidence for CP asymmetries in the three-body phase space. We are now analyzing data collected in Run II (2015+2016) and will combine the results with the ones from Run I. After a loose pre-selection, we use a multivariate method (MVA) to improve the signal significance. We show here the comparison of results with different inputs and different MVA methods, particularly boosted decision trees (BDT) and artificial neural networks (MLP). Our final choice, for the good performance and simplicity, is BDT with a reduced set of input variables, as compared to Run I selection.

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