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## Testing TMVA software in b-tagging for the search of MSSM Higgs bosons at the LHC

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We demonstrate the use of a ROOT Toolkit for Multivariate Data Analysis (TMVA) in tagging b-jets associated with heavy neutral MSSM Higgs bosons at the LHC.

The associated b-jets can be used to extract Higgs events from the Drell-Yan background, for which the associated jets are mainly light quark and gluon jets.

TMVA provides an evaluation for different multivariate classification techniques wrapped in a ROOT-integrated machine learning environment. Background discriminating power is demonstrated for various methods available in TMVA, such as rectangular cut optimisation, projective and multi-dimensional likelihood estimators, linear discriminant analysis with H-Matrix and Fisher discriminants, artificial neural networks and boosted/bagged decision trees.

The effect of choice of variables and variable transformation is described. TMVA working in transparent factory mode guarantees an unbiased performance comparison, since all classifiers are evaluated with the same training and test data. Finally, results are compared against previous studies using neural networks and standard methodology where associated b-jets can be identified using lifetime based tagging algorithms, which rely on displaced secondary vertices and track impact parameters.

### Submitted on behalf of Collaboration (ex, BaBar, ATLAS)

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