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A deep neural network for the simultaneous estimation of the b jet energy correction and resolution for CMS

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An algorithm to obtain point and dispersion estimates for the energy of jets arising from bottom quarks is presented. b-jet energy regression is trained on a sample of b jets from simulated pp collisions. A multivariate regression estimator employing jet-composition information and the properties of the associated reconstructed secondary vertexes is implemented using a deep feed-forward neural network. The results of the algorithm are used to improve the experimental sensitivity of analyses that make use of b jets in the final state, such as observation of the Higgs boson decay to a bottom quark-antiquark pair.

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