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Dijet angular distributions at sqrt(s) = 14 TeV

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Jet production is the most dominant hard process in hadron collision experiments. While jets are background for many new physics searches, jets can also be used as a signal. Because of the rich abundance of jets, many jet studies can be performed with little integrated luminosity.

The dijet angular distribution between the two hardest jets in the event has shown to be a very useful measurement; at low integrated luminosity it is a good tool to probe QCD, while with more statistics, a search for new physics, such as effects coming from large extra dimensions, becomes possible.

We present a Monte Carlo study of dijet angular distributions at sqrt{s}=14 TeV. First we perform a next-to-leading order QCD study; we calculate the distributions in four different bins of dijet invariant mass (Mjj) using different Monte Carlo programs and different jet algorithms, and we also investigate the systematic uncertainties coming from the choice of the parton distribution functions and the renormalization and factorization scales.

In the second part, we present the effects on the distributions coming from a model including gravitational scattering and black hole formation in a world with large extra dimensions. We report a discovery potential for the mass bin 1 < Mjj < 2 TeV at 10 pb−1 integrated luminosity.

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