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Background subtraction and jet quenching on jet reconstruction

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In order to asses the ability of jet observables to constrain the characteristics of the medium produced in heavy-ion collisions at the LHC, we investigate the influence of background subtraction and jet quenching on jet reconstruction, with focus on dijet asymmetries as currently studied by ATLAS and CMS. Using two models for the background, a full simulation and a toy model, we examine the influence of different background subtraction methods on dijet momentum imbalance and azimuthal distributions. We compare the usual jet-area based background subtraction technique and a variant of the noise-pedestal subtraction method used by CMS. The purpose is to understand what are the differences between the two techniques, given the same event configuration. Also, we analyze the influence of the quenching effect with the aim of understanding quantitatively how these methods are able to handle these modifications of the hard part of the collision. It turns out that the two background methods show different sensitivity to background fluctuations and quenching.

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