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Photon and π0 Triggered Two-Particle Correlations in Proton-Proton Collisions at LHC with ALICE

Content :

Pairs of direct photon and jet produced back-to-back in hard partonic processes provide the ultimate tool to perform a jet tomography measurement of the hot QCD medium cre- ated in heavy-ion collisions. On one hand, the point-like nature of the photon coupling allows us to measure the jet fragmentation function and to observe the modifications ex- perienced by jets while traversing a color dense medium. On the other hand, while purely hadronic observables are strongly biased towards surface production, photons sample the entire collision volume and therefore give access to the tomographic measurements of the dense medium. The experimental technique consists in tagging events with a well identi- fied high energy direct photon and measuring the hadrons emitted oppositely in azimuth to the photon. The feasibility of such measurements with the ALICE experiment at LHC has been validated with the help of Monte-Carlo data simulations [1]. As a first step and to establish a reference measurement for the future heavy-ion collisions, proton-proton collision data collected with ALICE in 2010 have been analyzed with the ultimate goal to construct the direct photon-charged hadron correlations. The preliminary results will be presented together with inclusive photon-charged hadrons correlation and π0-charged hadrons spec- tra all showing the characteristic di-jet pattern from where the momentum imbalance kT is extracted. Implications for the heavy-ion data analysis will be also discussed.

References

[1] Yaxian Mao, et al. , Eur. Phys. J. C (2008) 57 ; QM2009 poster.

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