Contribution ID: **87** Type: **bullet talk (poster)**

Search for jet quenching effects in small collision systems in ALICE

Monday 11 January 2021 19:40 (1h 30m)

Jet quenching is a possible consequence of the formation of a quark-gluon plasma (QGP) in collision systems, but to date no significant jet quenching has been observed in small systems. At the same time final states of pp and pPb collisions with large underlying event activity exhibit collective behavior that resembles hydrodynamic evolution. It is believed that observed level of the underlying event activity is related to intensity of multipartonic interactions and consequently also to the created volume of the hot and dense QCD matter.

Recent ALICE results on particle production in pp, p-Pb and Pb-Pb as a function of the (relative) transverse activity, (*RT*) NT, will be presented and compared to models. By subtracting the transverse activity and comparing to minimum-bias pp collisions, it is possible to obtain IAA as a function of NT. This IAA has a smooth trend in both near and away regions across all three systems and is consistent with little or no jet quenching in pp and p-Pb collisions at $\sqrt{s_{\rm NN}} = 5.02$ TeV. Further we will report results of jet quenching searches in high-multiplicity pp collisions at $\sqrt{s} = 13$ TeV, where we look for the broadening of the acoplanarity distribution measured by the semi-inclusive distribution of jets recoiling from a high-$p_{\rm T}$ hadron. Here, significant broadening is observed in the acoplanarity distribution obtained from high-multiplicity events w.r.t. minimum bias events, consistent with jet quenching. However, qualitatively similar features are also seen in pp collisions generated by the PYTHIA which does not include the simulation of jet quenching or any other QGP effects. We will discuss the current status of this analysis, and give prospects to understand the origin of this striking phenomenon.

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Session Classification: Poster

Track Classification: Multiparton interactions