## **Initial Stages 2021**



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## Characterizing system dynamics with two-particle transverse momentum correlations in pp, p-Pb, and Pb-Pb collisions at ALICE

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In ultrarelativistic heavy-ion collisions, two-particle transverse momentum correlations provide information on the system dynamics and properties. Recently published results by ALICE on the two-particle transverse momentum correlator  $G_2$  in Pb-Pb collisions demonstrate a narrowing of the correlation function in the azimuthal direction from peripheral to central collisions, which has initially been attributed to radial flow and delayed hadronization, and a broadening trend in the longitudinal direction, which has been associated with momentum transfer due to viscous effects. Furthermore, the longitudinal broadening is found to be consistent with the hypothesized lower bound of  $\eta/s$  and is in qualitative agreement with values obtained from anisotropic flow measurements. It is thus of high interest to elucidate how those transverse momentum correlators behave in small collision systems.

In this contribution we will present new measurements of  $G_2$  in pp and p-Pb collisions at  $\sqrt{s} = 7$  TeV and  $\sqrt{s_{\text{NN}}} = 5.02$  TeV, respectively, by the ALICE experiment at the LHC. The evolution of the correlation function with multiplicity from small to large collision systems will be discussed. The results will be compared and contrasted with two-particle number correlations ( $R_2$ ) and balance functions, as well as Monte Carlo models.

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