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First measurements of long-range near-side angular correlations in $\sqrt{s_{NN}} = 5$ TeV proton-lead collisions in the forward region

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Two-particle angular correlations are studied in proton-lead collisions at a nucleon-nucleon centre-of-mass energy of $\sqrt{s_{NN}} = 5$ TeV, collected with the LHCb detector at the LHC. The analysis is based on data recorded in two opposing beam configurations, in which either the direction of the proton or that of the lead remnant is analysed. The correlations are measured as a function of relative pseudorapidity, $\Delta\eta$, and relative azimuthal angle, $\Delta\phi$, for events in different classes of event activity and for different bins of particle transverse momentum. In high-activity events a long-range correlation on the near side is observed in the pseudorapidity range $2.0 < \eta < 4.9$. This is the first measurement of a long-range correlation on the near side in proton-lead collisions in the forward region and extends previous observations in the central region. The correlation increases with growing event activity and is found to be more pronounced in the direction of the lead beam. When comparing the proton and lead hemispheres for the same absolute activity the correlation strengths are compatible with each other.

On behalf of collaboration:

LHCb

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