



LHC Seminar

SPEAKER: Malgorzata Anna Janik

TITLE: **Insight into particle production mechanisms from angular correlations of identified particles in pp collisions measured by ALICE**

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ABSTRACT

Two-particle angular correlations are a robust tool which provide access to the underlying physics phenomena of particle production in collisions of both protons and heavy ions by studying distributions of particles in pseudorapidity and azimuthal angle difference. The correlation measurement is sensitive to several phenomena, including mini-jets, elliptic flow, Bose-Einstein correlations, resonance decays, conservation laws, which can be separated by selections of momentum, particle type and by analysing the shapes of the correlation structures.

In this talk, we report measurements of the correlations of identified particles and their antiparticles (for pions, kaons, protons, and lambdas) at low transverse momenta in pp collisions at $\sqrt{s} = 7$ TeV, recently submitted for publication by the ALICE Collaboration [arXiv:1612.08975]. The analysis reveals differences in particle production between baryons and mesons. The correlation functions for mesons exhibit the expected peak dominated by effects of mini-jet fragmentation and are reproduced well by general purpose Monte Carlo generators. For baryon pairs where both particles have the same baryon number, a near-side anti-correlation structure is observed instead of a peak. Such effects have usually been connected to conservation laws in e^+e^- collisions and were thought to be under theoretical control; however, our results present a challenge to the contemporary models (PYTHIA, PHOJET). This surprising effect is further interpreted in the context of baryon production mechanisms in the fragmentation process.