

XIV Polish Workshop on Relativistic Heavy-Ion Collisions: Interplay between soft and hard probes of heavy-ion collisions



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Probing space-time evolution at the femtometer scale in pp and Pb-Pb collisions with ALICE

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Quantum-mechanical effects and interactions cause correlations between particles with small momentum difference that carry information about the space-time evolution of the collision system on the femtometer scale. Measurements of these effects are usually done soon after new data arrive and provide a unique input to theoretical models. Nowadays, after almost a decade of the LHC operation and a significant amount of collected data, more differential and complex analyses are carried out. In this talk I will highlight the most recent ones, showing the direction in which the femtoscopic studies are currently advancing.

Detailed studies of the azimuthal event shape have been performed with pion correlations. In Pb-Pb collisions, azimuthally-sensitive femtoscopy, measured with respect to the 2nd and 3rd order reaction plane, provides new insight into collective behaviour of the source. In elementary pp collisions, a sphericity-differential analysis allows to differentiate between jetty and spherical events, shedding new light on the dependence of the apparent radii on pair transverse momentum k_T . In addition, femtoscopic correlations with unlike particles, such as pion-kaon pairs, probe the emission time difference between particle species.

Finally, the analysis of femtoscopic correlations is also being used to probe interactions at low relative momenta for a variety of particles and anti-particles that are not available as beams for scattering experiments.

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