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Femtoscopic correlations of identical charged particles in pp collisions at LHC energies with event-shape selection

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Femtoscopic correlations of two identical charged pions and kaons are measured in pp collisions at sqrt(s)=13 TeV by the ALICE collaboration at the Large Hadron Collider (LHC) to probe the space-time characteristics of particle production. High multiplicity pp collisions at the LHC reach particle densities comparable to those measured in peripheral heavy-ion collisions. A decrease of correlation radii with increasing pair transverse momentum is observed for both pion and kaon pairs in this study, which is a characteristic feature of such observables in heavy-ion collisions due to the strong collective flow. The one-dimensional pion and kaon correlations were also selected using the global event shape variable, the transverse sphericity. The radii extracted for spherical events are larger than those for jet-like events both for pions and kaons and demonstrate more flat dependence on the pair transverse momentum, while the radii corresponding to jet-like events demonstrate a more pronounced decrease with increasing pair transverse momentum. The event shape dependence of the femtoscopic radii will provide better understanding of the space-time structure of jet fragmentation and pp collisions with isotropic topologies.

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