



ID de Contribution: 13

Type: Non spécifié

Non-identical particle femtoscopy of pairs containing (anti)deuteron in relativistic heavy-ion collisions with ALICE at the LHC.

jeudi 7 novembre 2024 10:45 (25 minutes)

Femtoscopy studies of pion radiation in heavy-ion collisions have been conducted extensively at all available collider energies, both theoretically and experimentally. In all these studies a special interest is given to m_T dependency of pion femtoscopy radii, usually approximated by a power-law function at transverse momenta above $200\text{-MeV}/c$. However, the radii behaviour has been much less explored for the ultra-soft pions, possessing the transverse momentum comparable to or lower than the pion mass. For many experimental setups this region is difficult to measure. This work presents theoretical calculations of pion emission in the ultra-soft region in the two hybrid models – iHKM and LHYQUID+THERMINATOR2. Along with the particle transverse momentum spectra, the femtoscopy radii are calculated, both in one-dimensional and three-dimensional representations. The radii dependence on pair m_T shows, in particular, a departure from the power-law behaviour at ultra-soft momenta, potentially reflecting a decoupling of such slow pions from the rest of collectively expanding system.

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