HIGH MULTIPLICITY INFLUENCE ON THE PION-PION FINAL STATE INTERACTIONS IN RELATIVISTIC HEAVY ION COLLISIONS

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The corrections for two pion correlations due to electromagnetic final state interactions are investigated for high secondary multiplicities relevant for relativistic heavy ion collisions. The analysis is based on the numerical solutions of the Schrödinger equation exploiting a two-particle potential which is distorted by the multiparticle environment. Two different post freeze-out scenarios are examined. First, it is shown that the presence of a uniform and static post freeze-out medium results in a noticeable deviation from the standard Gamov factor (this factor, which is independent from a particular model, is taken as an indicator of two-particle electromagnetic final state interactions). Second, after the passage to a more realistic model which mimics the expansion of the multipion system, we come to the opposite conclusion. Because the density of the secondary particles drops down faster than $1/R^2$, where R is the distance from the fireball, the pion pair promptly escapes the initial high density region and the distortion of mutual Coulomb potential is weak. It is shown that even overestimating the density of the post freeze-out environment the correction factors obtained for SPS and LHC freeze-out conditions differ from the standard Gamov factor just in several percent.