PROBING THE "NUTCRACKER" BY TWO-PION CORRELATION

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Abstract

We make a quantitative discussion on how clearly the particular geometrical structure of the "nutcracker" scenario can be observed through the particle interferometry experiment. We apply a full (3+1)-dimensional hydrodynamical model with a first order phase transition to the space-time evolution of hot and dense matter in the non-central relativistic heavy ion collisions. The parameters of the hydrodynamical model can be so tuned as to reveal dynamically the "nutcracked" freeze-out hypersurface. By using the numerical solution of the hydrodynamical model, we calculate two-pion correlation functions. In the case of snapshot hypersurfaces which clearly show the nut-shell structure, we find a remarkable behavior at high relative momenta. We discuss the realistic possibility of observing the phenomenon in heavy ion experiments in detail.

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