

# Medium effects on two-particle correlations based on the theory of quantum open systems

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Hanbury Brown and Twiss (HBT) interferometry is used to investigate the shape and size of the matter produced in high-energy nuclear collisions. The Koonin-Pratt equation, which represents convolutions of the source function and the two-particle wave function in vacuum, has been used for the analysis. However, particles produced in a medium are affected during passing through it. In this talk, we extend the conventional framework of the HBT interferometry by considering the effect of medium. We employ the theory of open quantum system to represent a two-particle quantum system interacting with the environment. We obtain a master equation using a Hamiltonian that includes fluctuations caused by medium effects and investigate the time evolution of the density matrix. We find that the medium effect modifies the relative momentum dependence in the two-particle correlation function. This plays an important role in deducing the shape and size of the produced matter more precisely.

## Theory / experiment

Theory

## Group or collaboration name

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