

1 **Measurements of two-pion femtoscopy in Au+Au Collisions**
2 **at $\sqrt{s_{\text{NN}}} = 3.0, 3.2, 3.5, \text{ and } 3.9 \text{ GeV}$ from RHIC-STAR**

3 Youquan Qi¹

4 ¹*Central China Normal University, Wuhan, China*

5 for the STAR Collaboration.

6
7 Femtoscopic measurements are sensitive to the spatial and temporal char-
8 acteristics of the particle emitting-source, allowing us to probe the properties
9 of the matter created in heavy-ion collisions. In case of a first-order phase
10 transition, the duration of pion emission is expected to increase. Therefore,
11 measuring the energy dependence of the pion femtoscopy will help us to un-
12 derstand the nuclear matter phase structure.

13 In this talk, we present the results on two-pion femtoscopy measure-
14 ments in Au+Au collisions at $\sqrt{s_{\text{NN}}} = 3.0, 3.2, 3.5, \text{ and } 3.9 \text{ GeV}$ from the
15 STAR experiment. The extracted correlation strength (λ) and HBT radii
16 ($R_{\text{out}}, R_{\text{side}}, R_{\text{long}}, R_{\text{out-long}}$) from the 3D correlation functions will be presented
17 as a function of collision energy, centrality, rapidity, and pair transverse mo-
18 mentum. We will compare the measurements with the results from transport
19 model calculations. Finally, the implications for the properties of QCD matter
20 at high baryon density will be discussed.