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Performance studies of femtoscopy at CBM

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The study of nucleon-nucleon (N-N), nucleon-hyperon (N-Y), and hyperon-hyperon (Y-Y) interactions are fundamental to understanding the physics of relativistic heavy-ion collisions and neutron stars the existence of various exotic hadrons. Geometry and dynamics of the particle-emitting source in heavy-ion collisions can be inferred via the femtoscopy method. Two-particle correlations at small relative momentum exploit Quantum Statistics (QS) and the Final State Interactions (FSI), which allow one to study the space-time characteristics of the source of the order of 10^{-15} m and 10^{-23} s. Femtoscopy also enables the investigation of FSI between hadrons, as searches of possible bound states in neutron stars. The CBM experiment will cover a significant part of the QCD Phase Diagram using collisions of heavy nuclei for several beam energies, which baryon-rich region will be studied via femtoscopy. Baryon measurements together with meson ones provide complementary information about source characteristics.

In this poster, performance studies of femtoscopic measurements of various particle combinations at different collision energies and centralities will be shown.

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