

Probing color superconducting phases and neutron superfluidity via hydrodynamic evolution at FAIR and NICA.

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High baryon density regions of the cores of neutron stars are expected to have exotic phases such as color superconducting phases. The symmetry breaking pattern of these phases allows for topological vortices. Even in the lower density region of neutron star, neutron superfluid and associated topological vortices play important role in the dynamics of neutron star, e.g. in pulsar timings and glitches. We consider the possibility of formation of these superfluid phases in heavy-ion collision experiments, e.g. at FAIR and NICA, by carrying out Hydrodynamic simulation. Our result shows that existence of superfluid phases can be detected by studying the effect of vortices on power spectrum of flow fluctuations.

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