Omega and Phi production in a multiphase transport model with enhanced local parton density fluctuation scenario

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Abstract

Searching for QCD critical point and mapping the QCD phase diagram are major science goals of the Beam Energy Scan program in Heavy-Ion Collisions. Many exciting results have been published in the past decades and deepen our understanding on the QCD phase transition, such as the non-monotonic of net-proton direct flow, the net-baryon kurtosis. On the other hand, multi-strange hadron such as Omega and Phi are important probes for the search of the QCD phase boundaries. The Omega and Phi are expected to have relatively small hadronic interaction cross sections. Therefore, they can carry the information directly from the chemical freeze-out stage with little or no distortion due to hadronic rescattering. As a result, the production of the Omega and Phi particle offers a unique advantage in probing the transition from partonic to hadronic dynamics. In this talk, we study the Omega and Phi production in a multiphase transport model with employment enhanced local parton density fluctuation scenario. Our calculations describe the pt spectrum of experiment data well and predict an enhanced production of Omega and Phi near the QCD phase boundary. In particularly, we find that the Baryon/Meson ratio is more sensitive to the local density fluctuation strength. The ratio will increased significantly in comparison with original AMPT model calculation. We also study the flow harmonic of multistrange hadron in response to the local density fluctuation. Physics implication will be discussed.