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Beam Energy Scal program with EPOS model

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Studies of collisions of highly accelerated ions are the key to understand the creation of quark matter. Experimental physicists put considerable effort in collecting information characterising the various processes occurring during such collisions. In order to describe such scenarios, complex models have been constructed, one of them being the EPOS approach. It applies Parton-based Gribov-Regge theory as an initial condition, introduces the core-corona approach, hydrodynamical evolution and hadronic cascades as well. The model is used by experimental physicist at the LHC or in cosmic ray physics.
At the Brookhaven National Laboratory, the STAR collaboration is currently investigating an interesting project called Beam Energy Scan. The QCD phase diagram is studied in order to understand the phase transitions close to the critical point, which should be in the energy domain studied in this program. Models have difficulties to describe this energy range properly. The aim of our investigation is to adapt the EPOS model to describe correctly collisions of ions with energies studied in the framework of the BES program.
The detailed description of the theory included in EPOS model will be presented. The energy dependence of the separation into the core and corona will be discussed, and the way it affects transverse momentum spectra of identified particles and the observables of the azimuthal anisotropy of expanding matter. The particles from the corona are strongly affected by the radial flow and the flow asymmetries. The results of different types of analysis of elliptic flow will be discussed. The simulation results for collisions of Au+Au at selected BES energies will be presented in comparison with the published STAR data.

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