Multi-phase transport model for heavy ion collisions at RHIC

Z. Lin [a] S. Pal [a] C. M. Ko [a] B. A. Li [b] B. Zhang [b]

[a] *Cyclotron Institute and Physics Department, Texas A&M University, College Station, Texas 77843*

[b] *Department of Chemistry and Physics, Arkansas State University, State University, Arkansas 72467*

Presented by: Z. Lin

Abstract

To study heavy ion collisions at RHIC, we have developed a multi-phase transport (AMPT) model [1] by replacing jet quenching in the HIJING model with explicit parton cascade based on the ZPC model and including final-state hadronic interactions using the ART model. We find that a larger parton-parton cross section than used in the default ZPC model is required to reproduce the total charged particle multiplicity near mid-rapidity measured by the PHOBOS collaboration at RHIC for Au+Au collisions at center-of-mass energies of 56 and 130 AGeV. We also find that final-state hadronic interactions reduce the anti-proton to proton ratio due to annihilation. The AMPT model further allows us to study the relative importance of the partonic and hadronic stages on strangeness production, J/ψ suppression [2] and elliptic flow [3].

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