Abstract Submitted
for the DNP13 Meeting of
The American Physical Society

Tracing jet energy loss in relativistic heavy-ion collisions using a multiphase transport model[1] TERRENCE EDMONDS, FUIQANG WANG, Purdue University, STAR COLLABORATION — Energetic partons lose energy in the quark-gluon plasma (QGP) created in relativistic heavy-ion collisions. This jet-quenching phenomenon provides a powerful tool to study the properties of the QGP medium via single particle production rate at high transverse momentum (pt) and two-particle correlation measurements. This REU project studies the effects of parton energy loss on single particle yield and two-particle correlations by tracing energetic partons traversing the heavy-ion medium by using A Multi-Phase Transport (AMPT) model. The AMPT model is modified to output the history information of all parton interactions during the system evolution, in addition to the already available information of the initial state and the final state hadrons from parton coalescence. The initial high-energy partons are followed in each step of their collisions with the medium partons all the way to the final state, before escaping the medium. The particles that they collide with are also tracked. By following high energy particles (jets) and the particles they collide, this project specifically looks at how the direction of the energetic parton is changed via collisions in the medium and how the energy is redistributed in the medium. The implications of the results in terms of interpretations of the experimental jet-quenching and correlation data will be discussed. What additional insights this study can bring to the overall heavy-ion physics research will be outlined.

[1]National Science Foundation

Terrence Edmonds
Purdue University

Date submitted: 31 Jul 2013 Electronic form version 1.4