Balance Functions: A signal of late-stage hadronization

Scott Pratt [a] Pawel Danielewicz Steffen Bass

[a] *National Superconducting Cyclotron Laboratory and Department of Physics, Michigan State University, East Lansing, MI 48824*

Presented by: Scott Pratt

Abstract

If hadronization is postponed several fm/c due to the high energy densities and mesoscopic sizes inherent to a Au+Au collision at RHIC, the produced charges and their balancing anti-charges should be more tightly correlated in rapidity. We describe how balance functions can statistically identify particle-antiparticle partners. In particular, we illustrate how the hadrons-from-strings scenario, where hadrons are produced within the first one fm/c, can be distinguished from the quark-gluon-plasma scenario, where much of the matter does not hadronize until several fm/c into the collision. We also argue that balance functions can provide insight into a number of other issues such as strangeness enhancement, antibaryon production, J/Psi suppression and jet quenching.

Preprint submitted to Elsevier Preprint *20 December 2000*