Abstract Submitted
for the DNP10 Meeting of
The American Physical Society

How to really measure fragmentation functions with two-particle correlations in p-p and A+A collisions MICHAEL TANNENBAUM, Brookhaven National Laboratory — For the past decade, measurements of semi-inclusive single identified particle spectra and two-particle correlations in p-p and A+A collisions at RHIC have produced a treasure trove of results which indicate a suppression of hard-scattered partons in the medium produced in A+A collisions. It still remains to be determined unambiguously whether the partons emerge from the medium having lost energy (or whether some emerge from well within the medium without having lost energy) then fragment normally outside; whether vacuum fragmentation is modified inside the medium; or whether partons are stopped or absorbed so that only surface emission occurs. One important lesson learned is that the away-side p_{Ta} distribution of particles opposite to a trigger particle (e.g. a π^0), which is itself the fragment of a jet, does not measure the fragmentation function. The key to measuring the fragmentation function and its possible modification is to know the energy of the original parton which fragments. This can be accomplished by measuring the correlated hadrons opposite to a direct-single γ from the reaction $g + q \to \gamma + q$. Comparison to the $\xi = \ln 1/z$ representation of fragmentation functions measured in $e^+ + e^-$ collisions, where z is the fragmentation variable, becomes useful for direct-$\gamma - h$ measurements over the full z or ξ range when a semi-log plot is used. Examples will be presented.

Michael Tannenbaum
Brookhaven National Laboratory

Date submitted: 30 Jun 2010 Electronic form version 1.4