Measurements of semi-inclusive $\gamma$+jet and hadron+jet
distributions in heavy-ion collisions at $\sqrt{s_{NN}} = 200$ GeV with
STAR

Yang He, for the STAR Collaboration
Shandong University

We present measurements of the semi-inclusive distribution of charged-
particle jets recoiling from $\gamma$ and $\pi^0$ triggers in $p+p$ and central Au+Au colli-
sions, and from charged hadron triggers in smaller collision systems (Ru+Ru
and Zr+Zr) at $\sqrt{s_{NN}} = 200$ GeV by STAR. The large uncorrelated back-
ground in heavy-ion collisions is removed using the event mixing technique,
enabling systematically well-controlled measurements at very low jet trans-
verse momentum $p_T^{jet}$ and large jet radius R. We report corrected distribu-
tions as a function of both $p_T^{jet}$ and recoil azimuthal deflection with respect
to trigger axis for R = 0.2 and 0.5 jets in $p+p$ and Au+Au collisions. These
measurements probe medium-induced jet yield suppression, intra-jet broad-
ening, and jet acoplanarity, as well as their dependence on the color charge
in heavy-ion collisions. We also present comparisons to theoretical calcula-
tions incorporating Sudakov broadening in vacuum and jet quenching in the
medium. Jet yield suppression in central to peripheral collisions is measured
in Ru+Ru and Zr+Zr collisions to study the system size dependence of jet
energy loss. These together provide a multi-messenger study of the physical
processes driving the jet quenching phenomenon.