

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

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