

1                    Jet substructure in p+p and p+Au  
2 collisions at  $\sqrt{s_{\text{NN}}} = 200$  GeV at STAR

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4                    **Abstract**

5                    In order to attribute the partonic energy loss within jets (jet quench-  
6 ing) observed in A+A collisions to the traversal of partons through the  
7 hot QCD medium, it is necessary to examine cold nuclear matter (CNM)  
8 effects on the corresponding jets. Such examination has historically been  
9 done using p+A collisions. In this talk, we present fully corrected mea-  
10 surements of jet substructure – with a focus on jet mass – in p+A collisions  
11 at STAR at  $\sqrt{s_{\text{NN}}} = 200$  GeV as a function of the event activity (EA) to  
12 increase or decrease the magnitude of CNM effects. EA is determined in  
13 backward (Au-going) rapidity ( $3.3 < |\eta| < 5.0$ ) by the STAR Beam-Beam  
14 Counter detector to minimize auto-correlation effects of jet measurements  
15 at mid-rapidity. By differentiating the measured jets by rapidity, we ex-  
16 plore potential Bjorken- $x$  dependence in jets exiting the gold nucleus or  
17 proton. Finally, we compare the results in p+A collisions to fully cor-  
18 rected corresponding measurements in p+p collisions and current vacuum  
19 Monte Carlo models, as well as a heavy-ion Monte Carlo model given by  
20 PYTHIA-8 Angantyr, to isolate these CNM effects in anticipation of an  
21 upcoming jet mass measurement in A+A collisions.