

# sPHENIX + Forward Calo Jet Study

Dennis Perepelitsa: running p+p @ 200 GeV in PYTHIA-8 for gamma-jet with  $p_{T\text{jet}} > 12$  and for jet-jet with  $p_{T\text{jet}} > 15$ , then FastJet anti-kT  $R = 0.4$  jetfinder. No HIJING underlying event, no GEANT simulation.

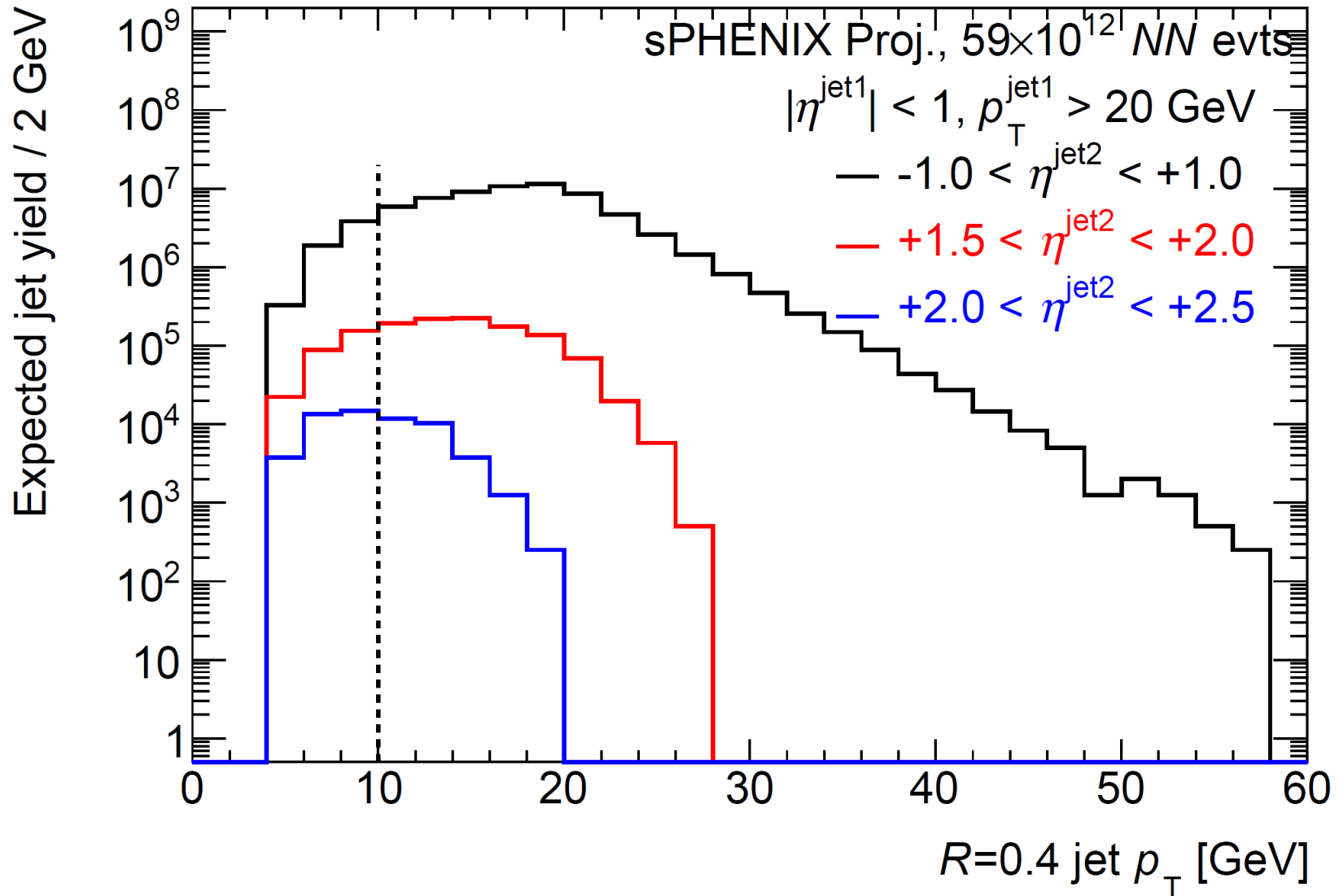
Thus, really about kinematics and statistics.

In 5-year run plan, Au+Au statistics are equivalent to 59 trillion N+N statistics. That is what is shown in terms of counts. Note that p+Au are equivalent to 2.8 trillion N+N statistics.

We assume sPHENIX barrel ( $|\eta| < 1$ ) tags single photons  $> 15$  GeV and jets  $> 20$  GeV. Then as correlation measurements we can statistically get jets  $> 10$  GeV at forward rapidity (not unreasonable – see STAR h-jet measurements for example).

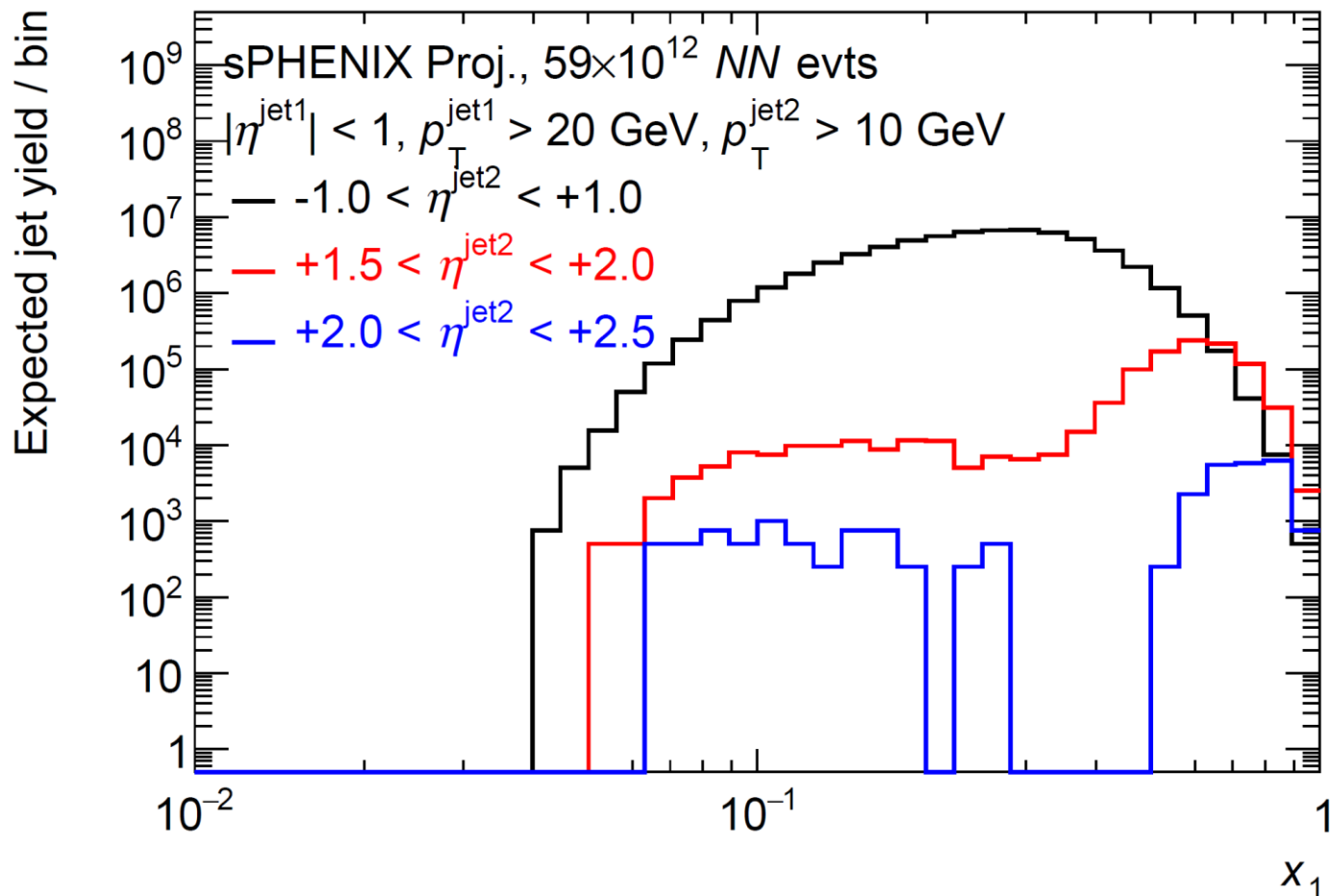
1

Dijet case – one in the barrel and one at forward rapidity.  
Assume one can measure correlated jet down to  $p_T > 10$  GeV  
Counts correspond to Au+Au equivalent NN events.



## Dijet case – one in the barrel and one at forward rapidity.

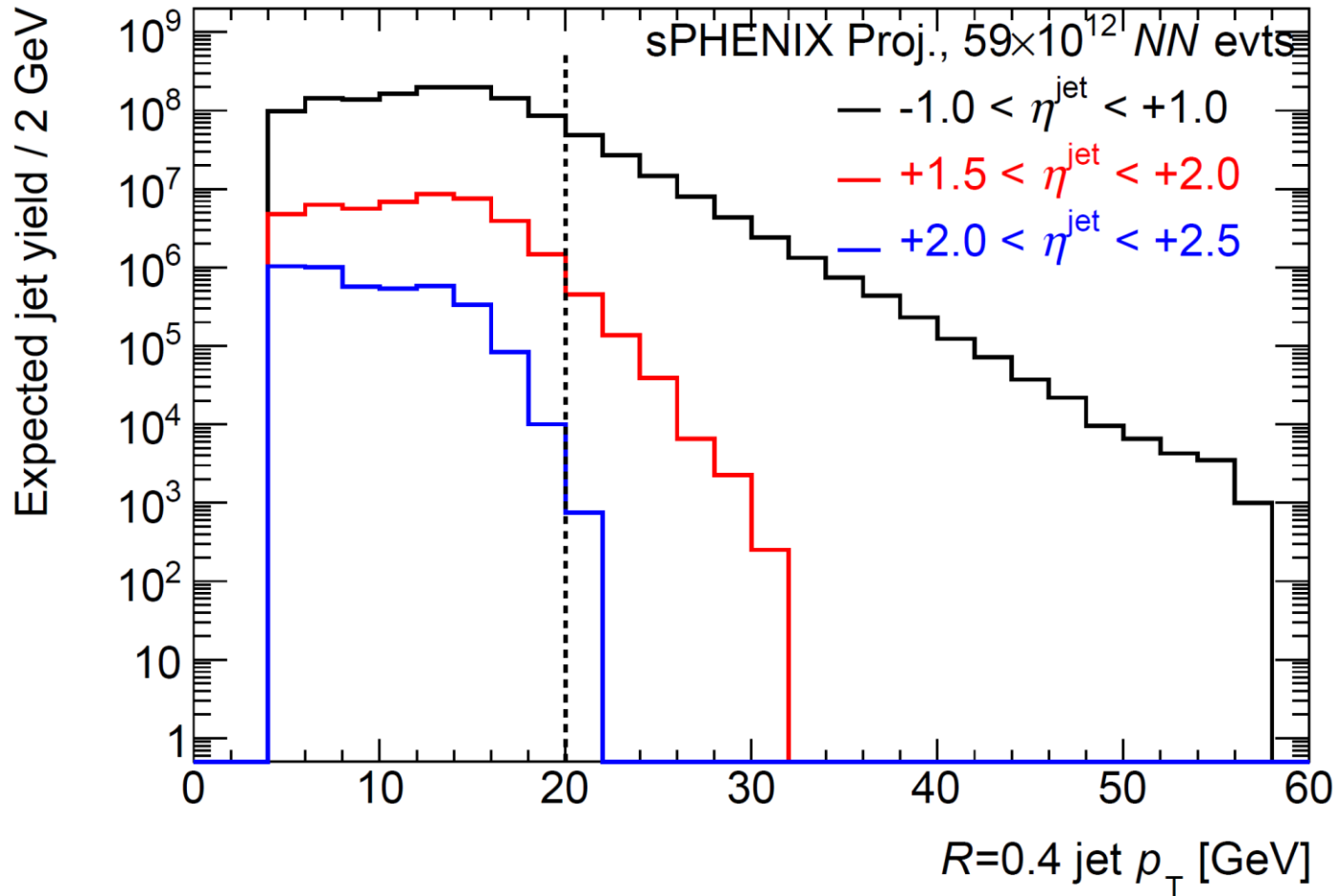
Pushing up to very high  $x_1$ . Interesting also in p+A in terms of shrinking proton picture. Not unique kinematics in  $x$ , but ability to check if physics scales with  $x$ , or eta, or local eta QGP density, etc..



## 2

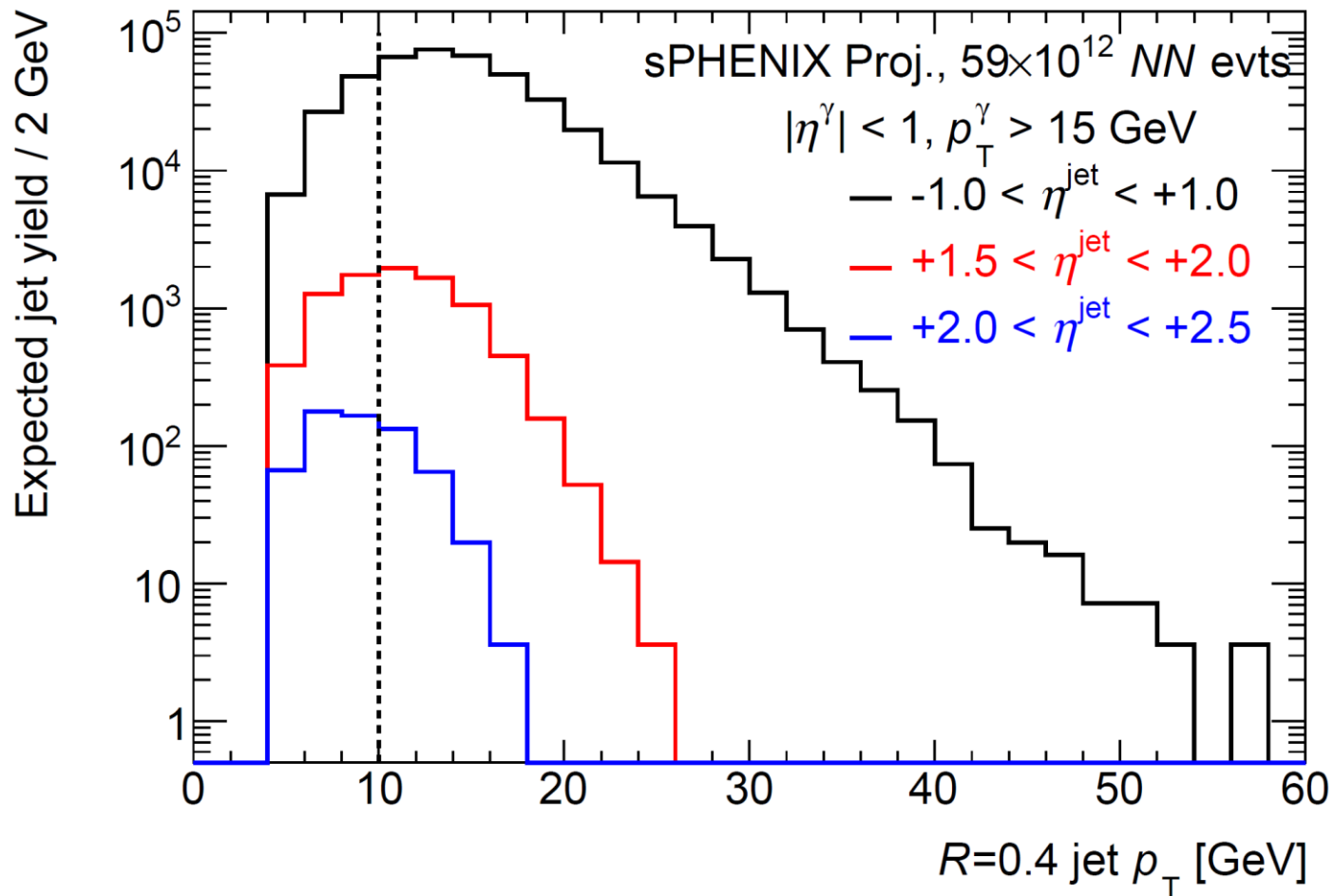
## Single jets.

Assume one can measure single jet down to  $p_T > 20$  GeV  
Counts correspond to Au+Au equivalent NN events.



3

Photon-jet case: photon in the barrel and jet at forward rapidity.  
Assume one can measure correlated jet down to  $p_T > 10$  GeV  
Counts correspond to Au+Au equivalent NN events.



## Photon-jet case: photon in the barrel and jet at forward rapidity.

Pushing up to very high  $x_1$ . Interesting also in p+A in terms of shrinking proton picture. Not unique kinematics in  $x$ , but ability to check if physics scales with  $x$ , or eta, or local eta QGP density, etc..

