

Quark Matter 2023

R=0.4 results from [ATLAS-CONF-2023-060](#)  
[Phys. Rev. C 107, 054908](#)

# Jet radius dependence of Pb+Pb and pp dijet momentum balance with the ATLAS detector

Anabel Romero, for the ATLAS Collaboration

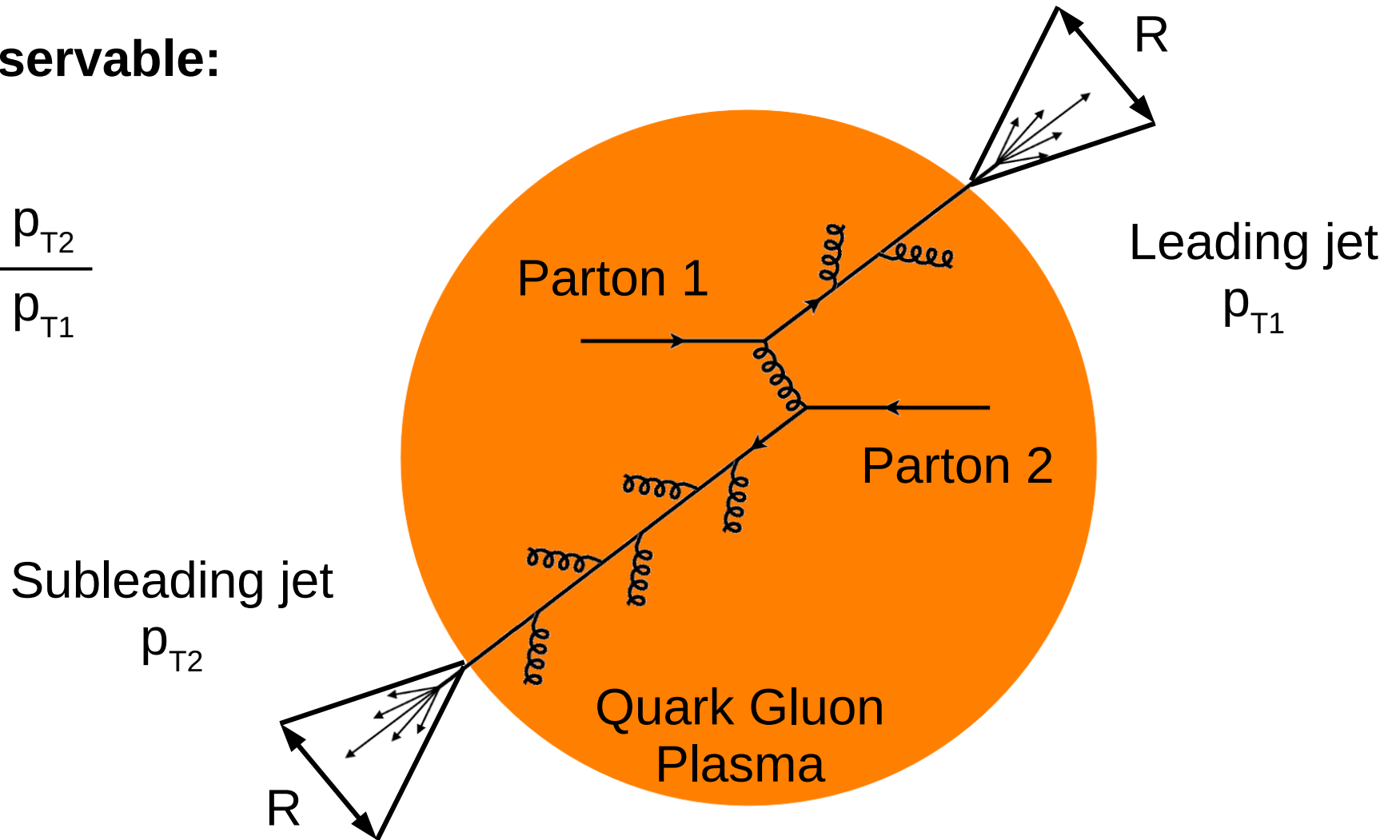
September 09, 2023



UNIVERSITY OF  
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## Dijet observable:

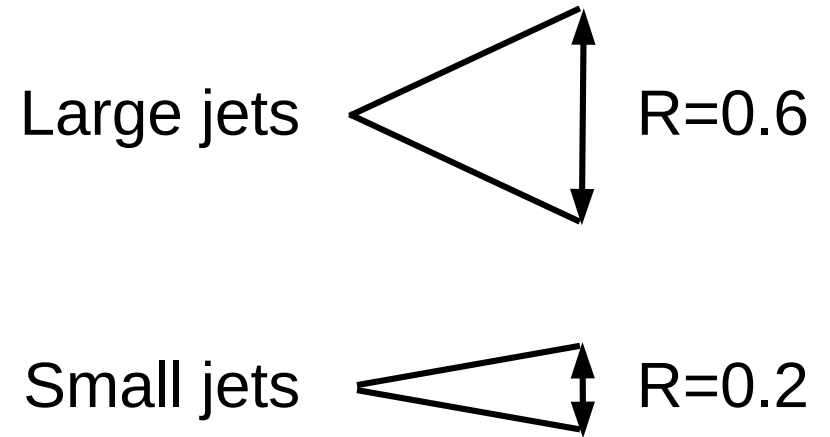
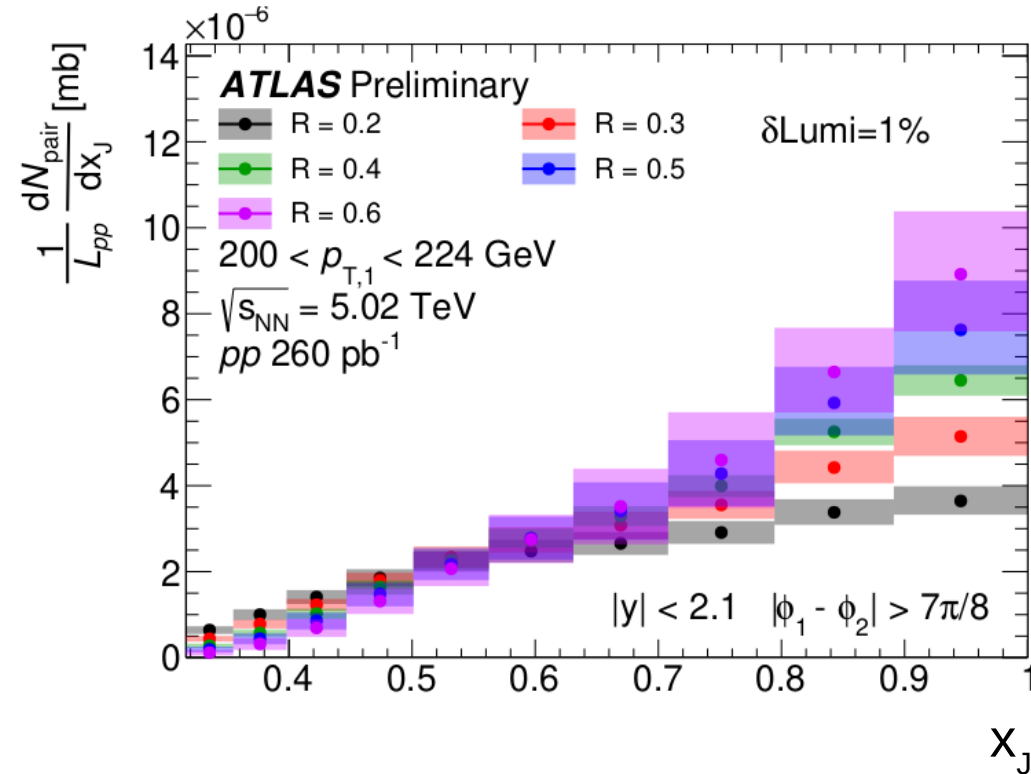
$$x_j = \frac{p_{T2}}{p_{T1}}$$



A jet radius dependent dijet analysis is sensitive to the momentum balance and the energy distribution to larger angles.

# Absolutely normalized $x_j$ distributions:

pp ●●

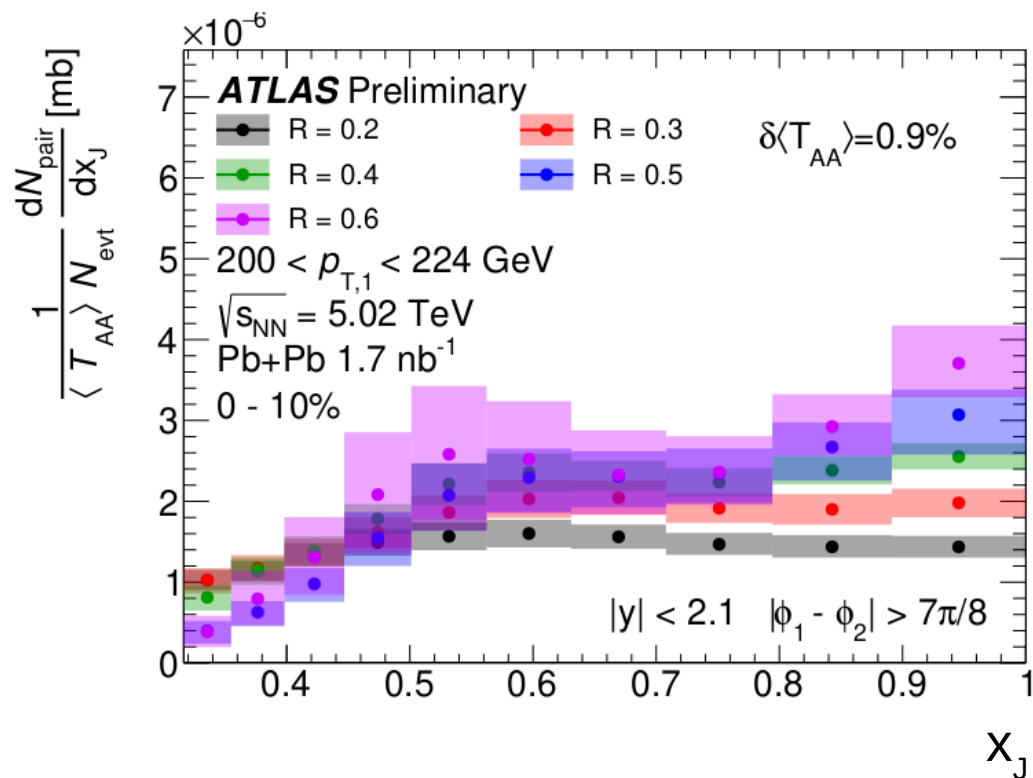
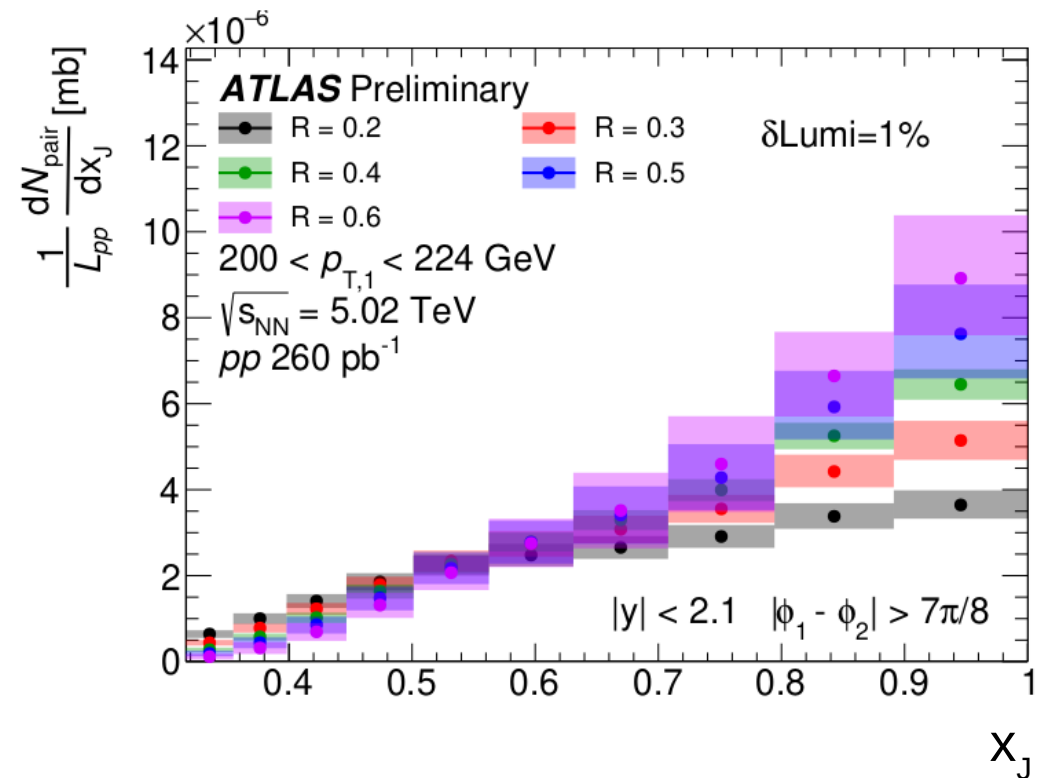


Larger jets are more balanced in  $p_T$ .

# Absolutely normalized $x_j$ distributions:

pp ●●

0-10% Pb+Pb ○○



More quenching towards more central collisions.

$J_{AA}$  vs jet radius:

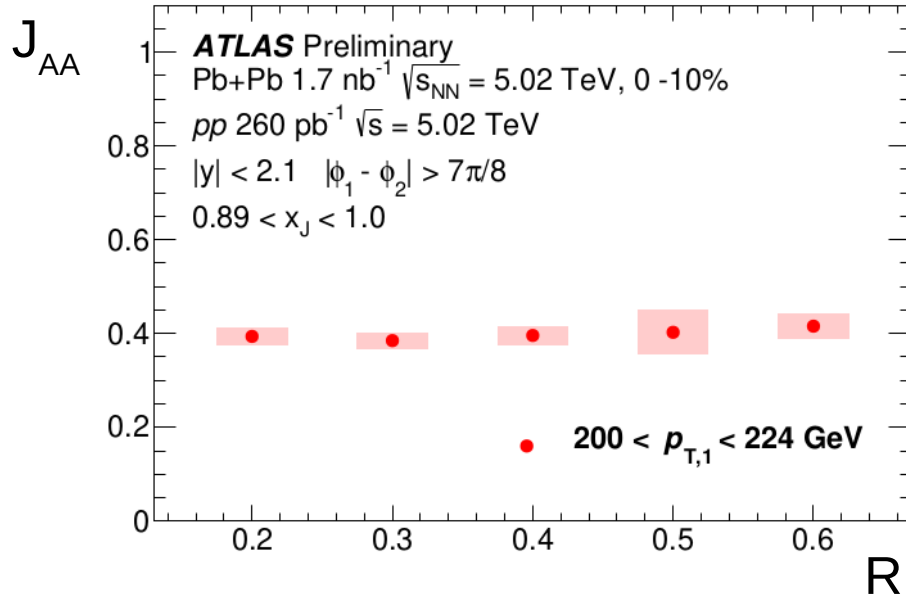
$$J_{AA} = \frac{\text{Pb+Pb}}{\text{pp}}$$

Pb+Pb to pp ratio  
of  $x_j$  distributions



**Balanced dijets**

$$0.89 < x_j < 1.0$$



$J_{AA}$  vs jet radius:

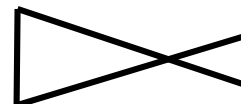
$$J_{AA} = \frac{\text{Pb+Pb}}{\text{pp}}$$

Pb+Pb to pp ratio  
of  $x_j$  distributions



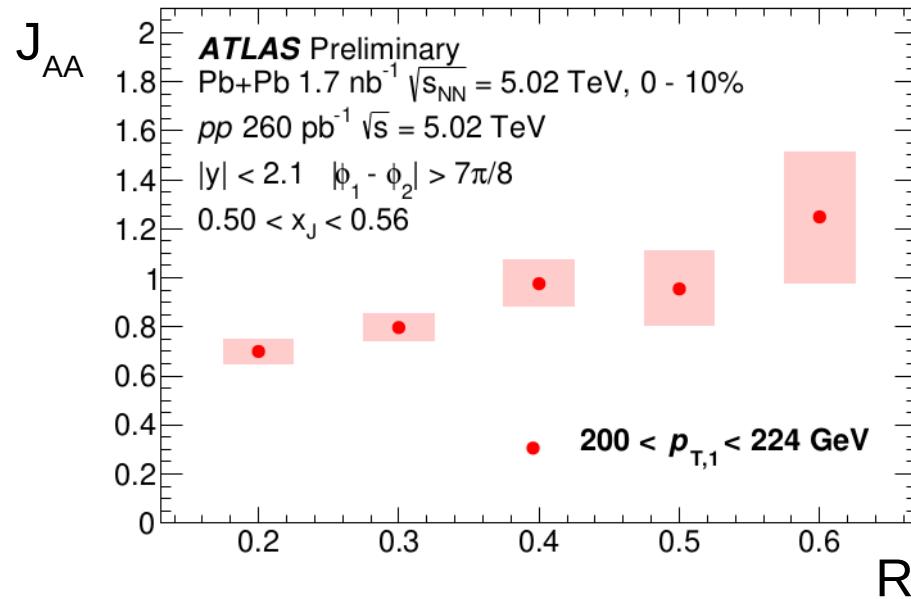
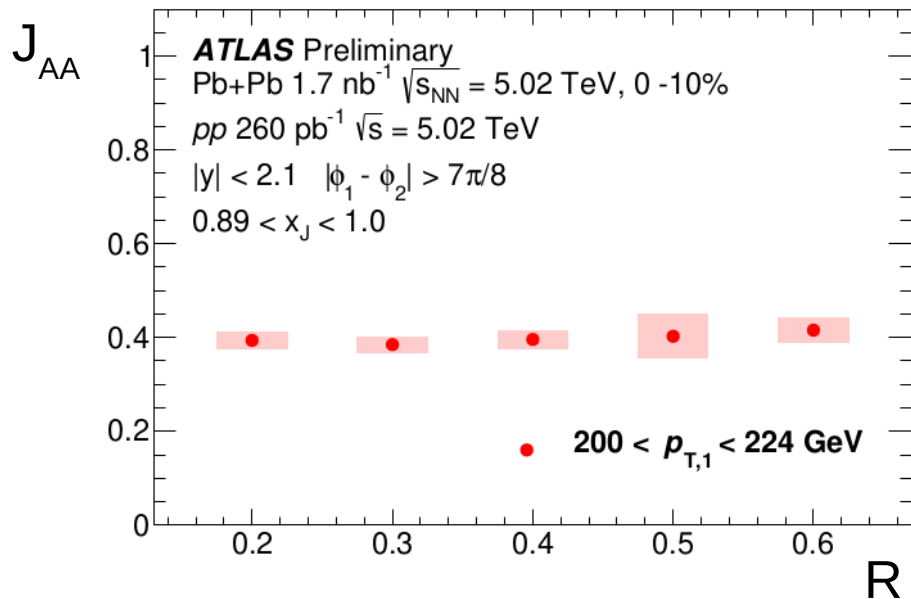
**Balanced dijets**

$$0.89 < x_j < 1.0$$



**Imbalanced dijets**

$$0.5 < x_j < 0.56$$

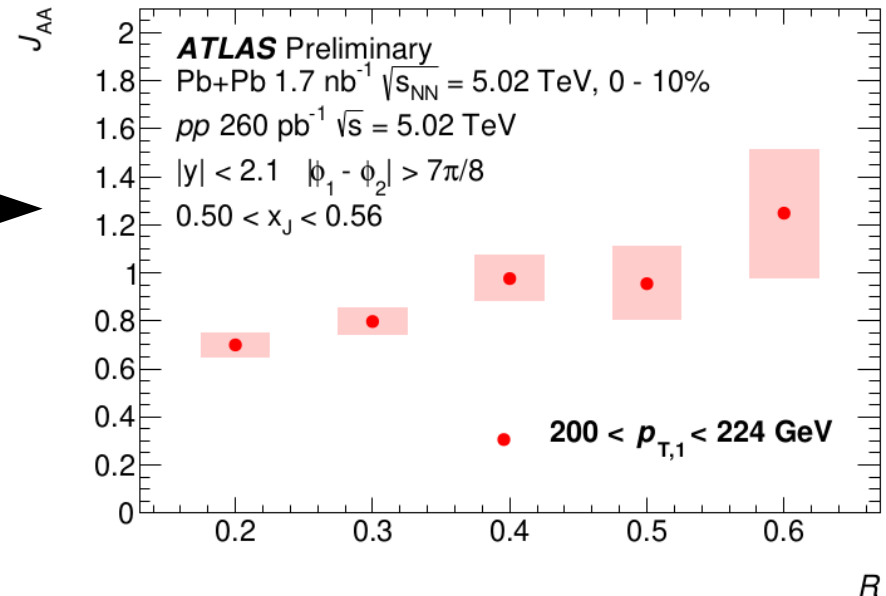
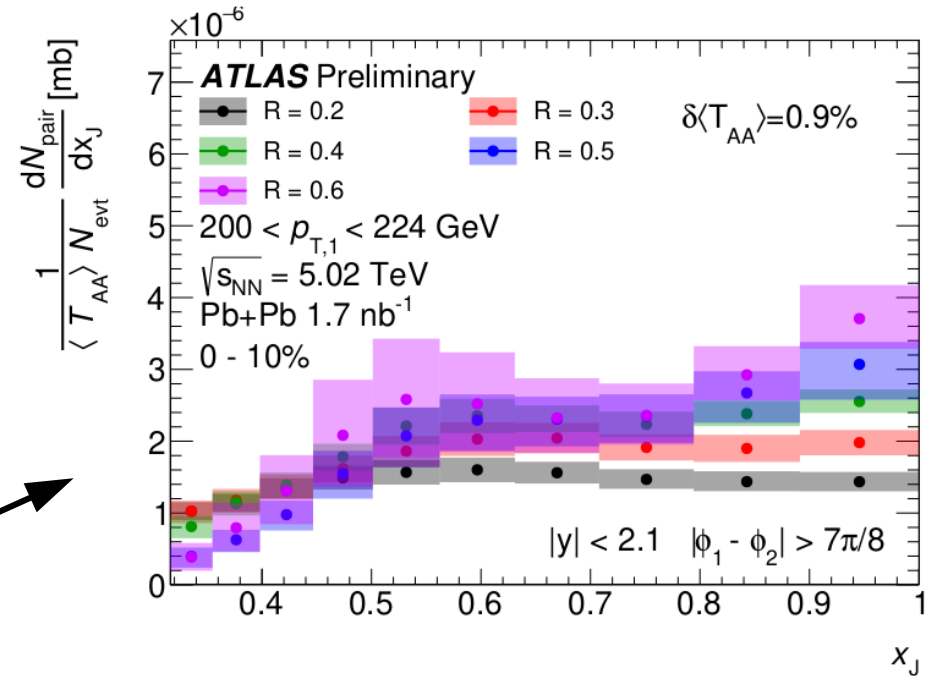


Imbalanced dijets are less suppressed for larger jet radii.

# Conclusions:

- A jet radius dependent dijet analysis is sensitive to the momentum balance and the energy distribution to larger angles.
- Larger jets are more balanced in  $p_T$ .
- Imbalanced dijets are less suppressed for larger jet radii.

[ATLAS-CONF-2023-060](#)

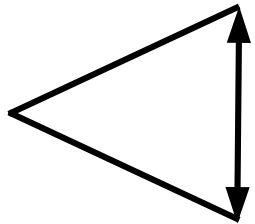


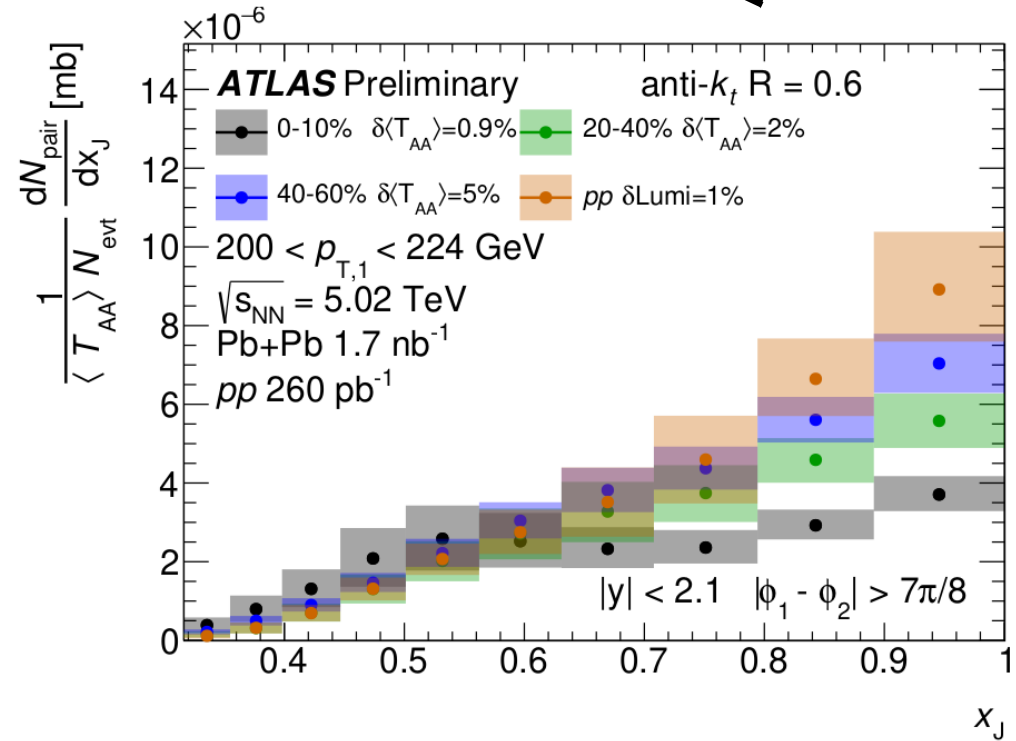
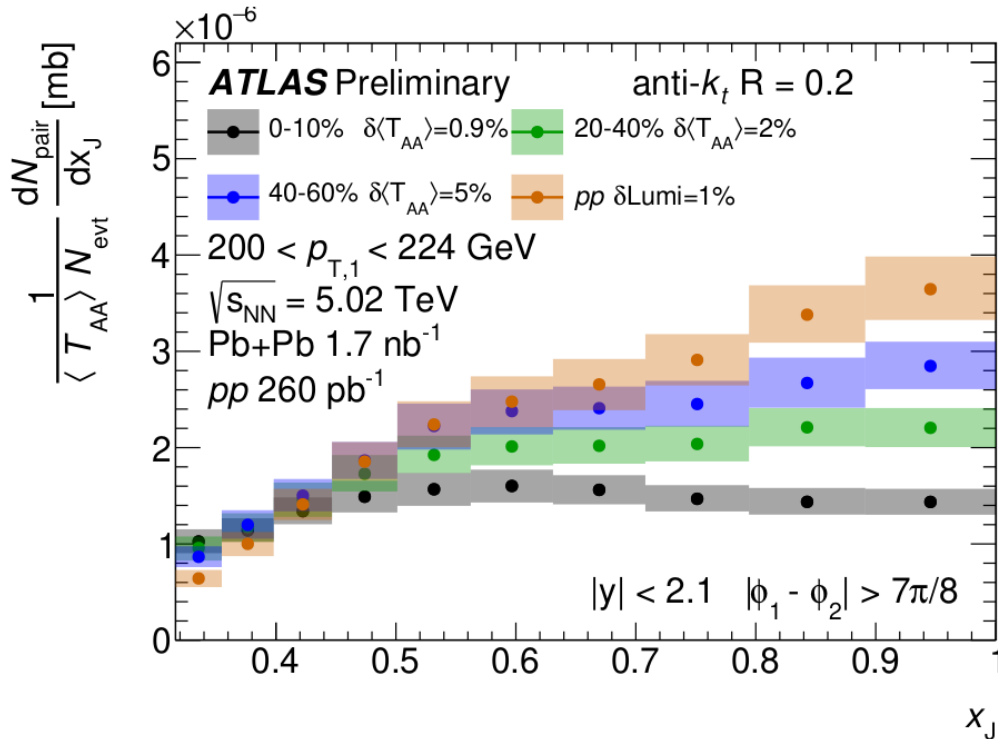
# Backup



# $x_j$ distributions: comparison of centralities

Small jets   $R=0.2$

Large jets   $R=0.6$

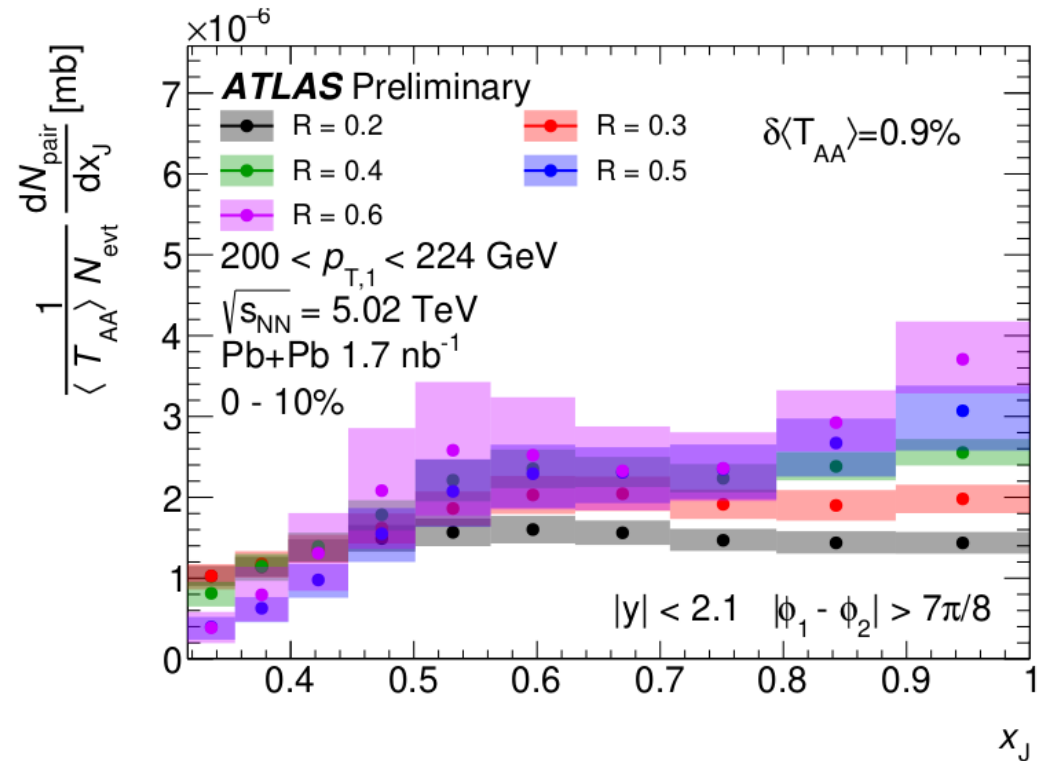
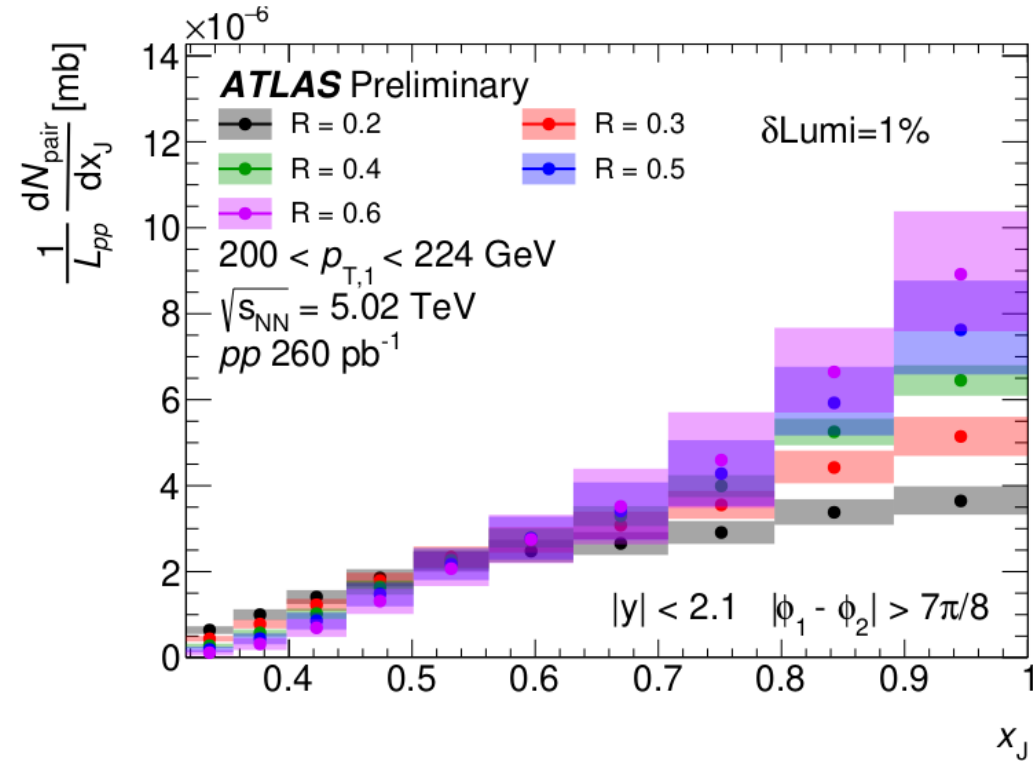


Both large and small jets are more quenched towards more central collisions.

# $x_j$ distributions: comparison of radii

pp ●●

0-10% ○○



Larger jets are more balanced in  $p_T$ .