

Comparing Lund diagrams Hadronic, Partonic and Shower in JEWEL

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August 14th, 2019

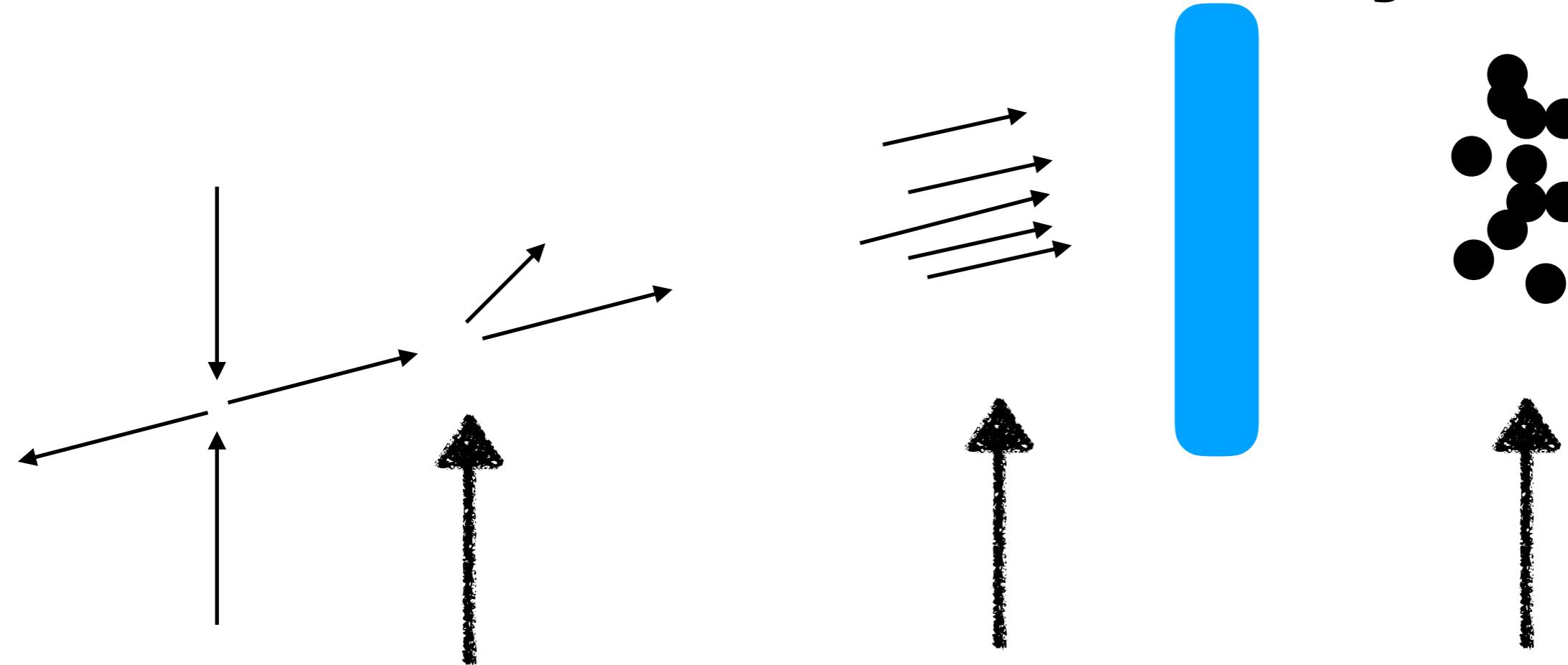
EMMI RRTF @ GSI

*Lets go “Lunni!”
- Gunther Roland*

Lets define what we are plotting

- 5 TeV collisions w/ JEWEL+PYTHIA (essentially PYTHIA-6) w/
virtuality ordered parton shower
- Primary jet clustering algorithm - anti-kT, **R=0.8 Jets with pT > 70 GeV**
- **X-axis : $\ln(1/\Delta R)$**
Y-axis : $\ln(k_T(\text{GeV}))$
- Three levels of Lund diagrams -
 - **Hadrons, Partons** - start from anti-kT clustered jets (wide radius R=0.8) and re-cluster with C/A, kT, anti-kT
 - **Parton Shower** - Start from the true MC shower search and extract 1 -> 2 splittings from HepMC file
note: jewel w/ recoils, 2 -> 2 scatterings with thermal particles
***NOT* included**

Kinds of Lund diagrams we will look at today -



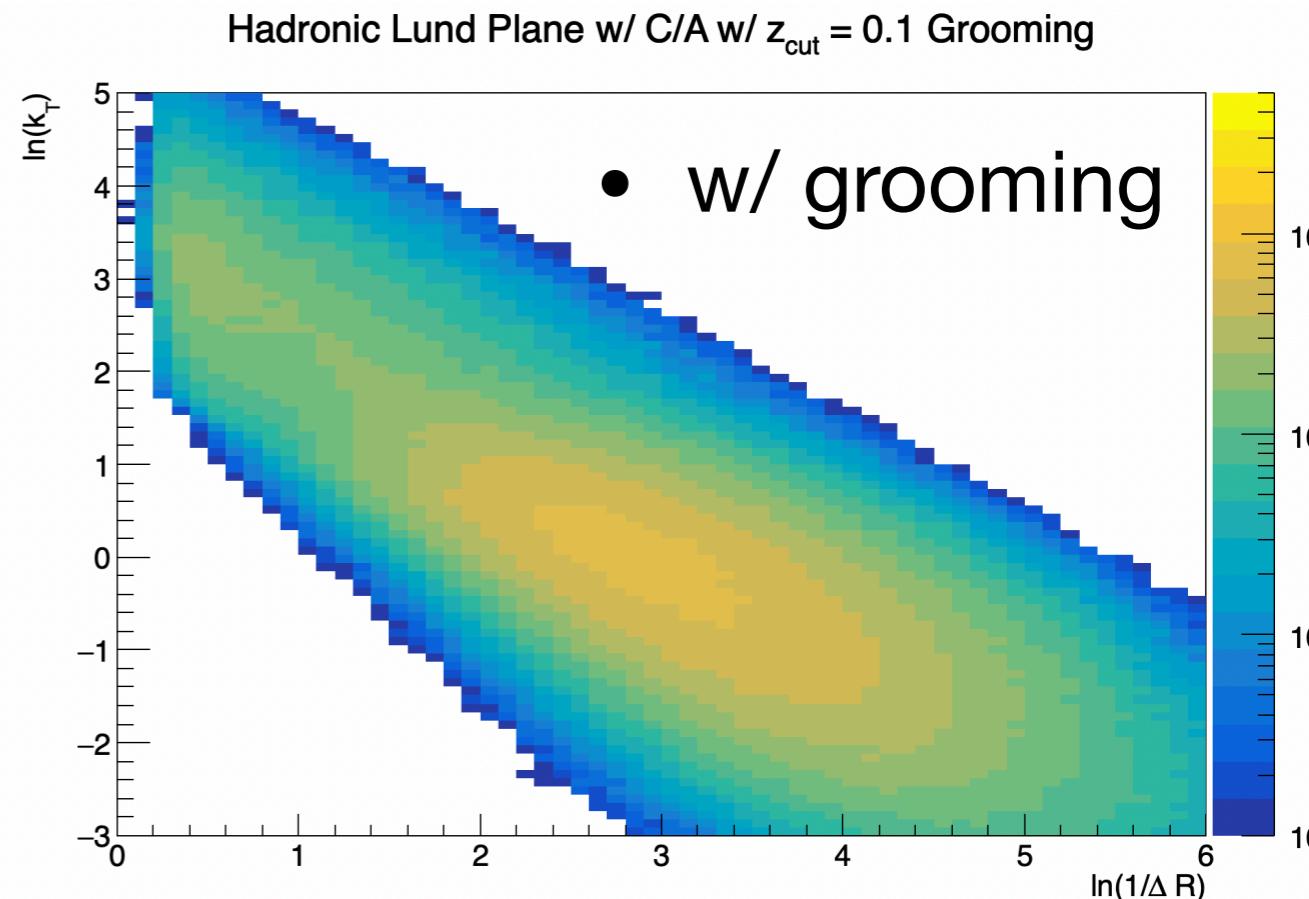
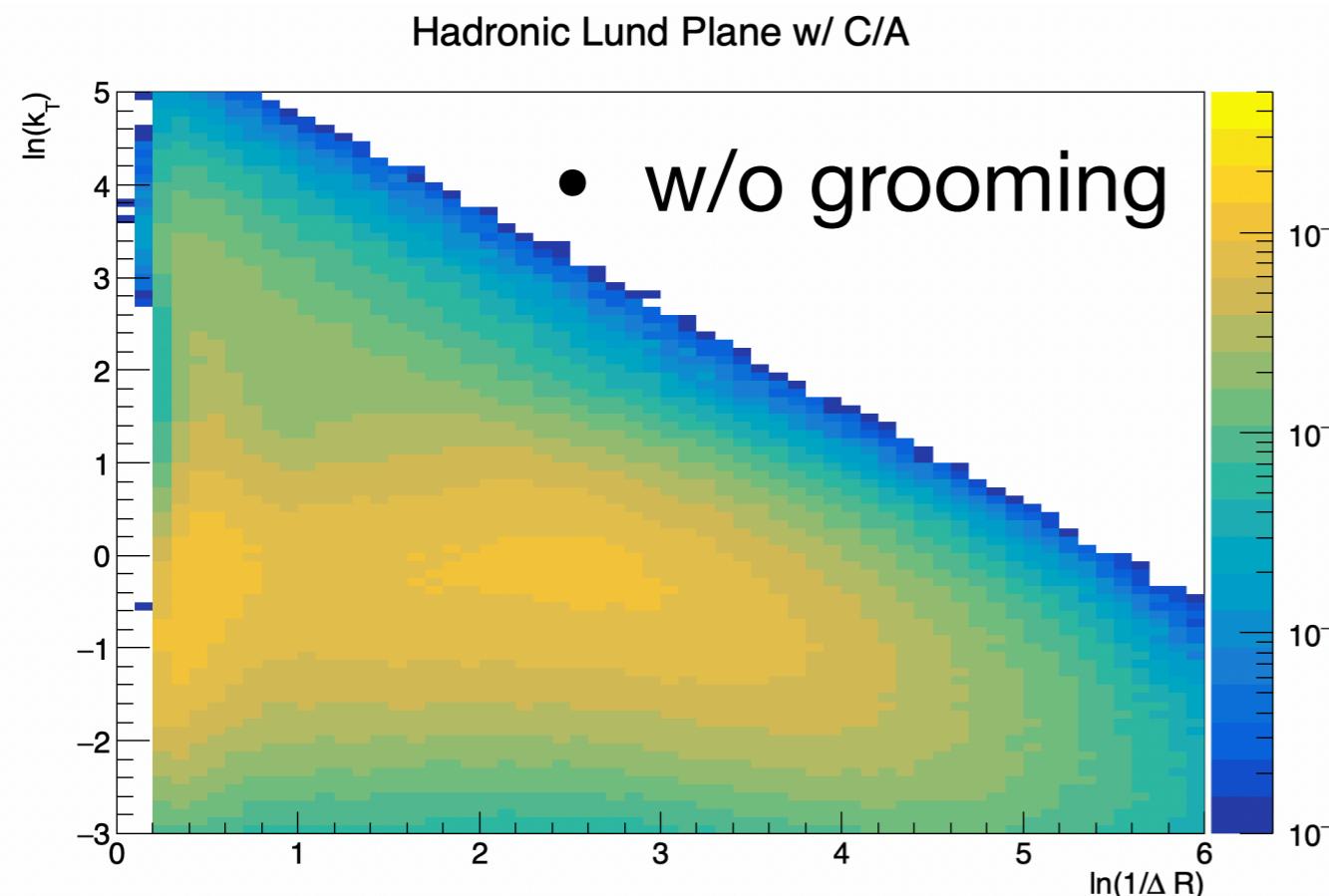
- Parton Shower
1->2
Splittings

- Partons before hadronization :
Jet clustering + reclustering + follow harder prongs

- Final state hadrons :
Jet clustering + reclustering + follow harder prongs

pp Collisions

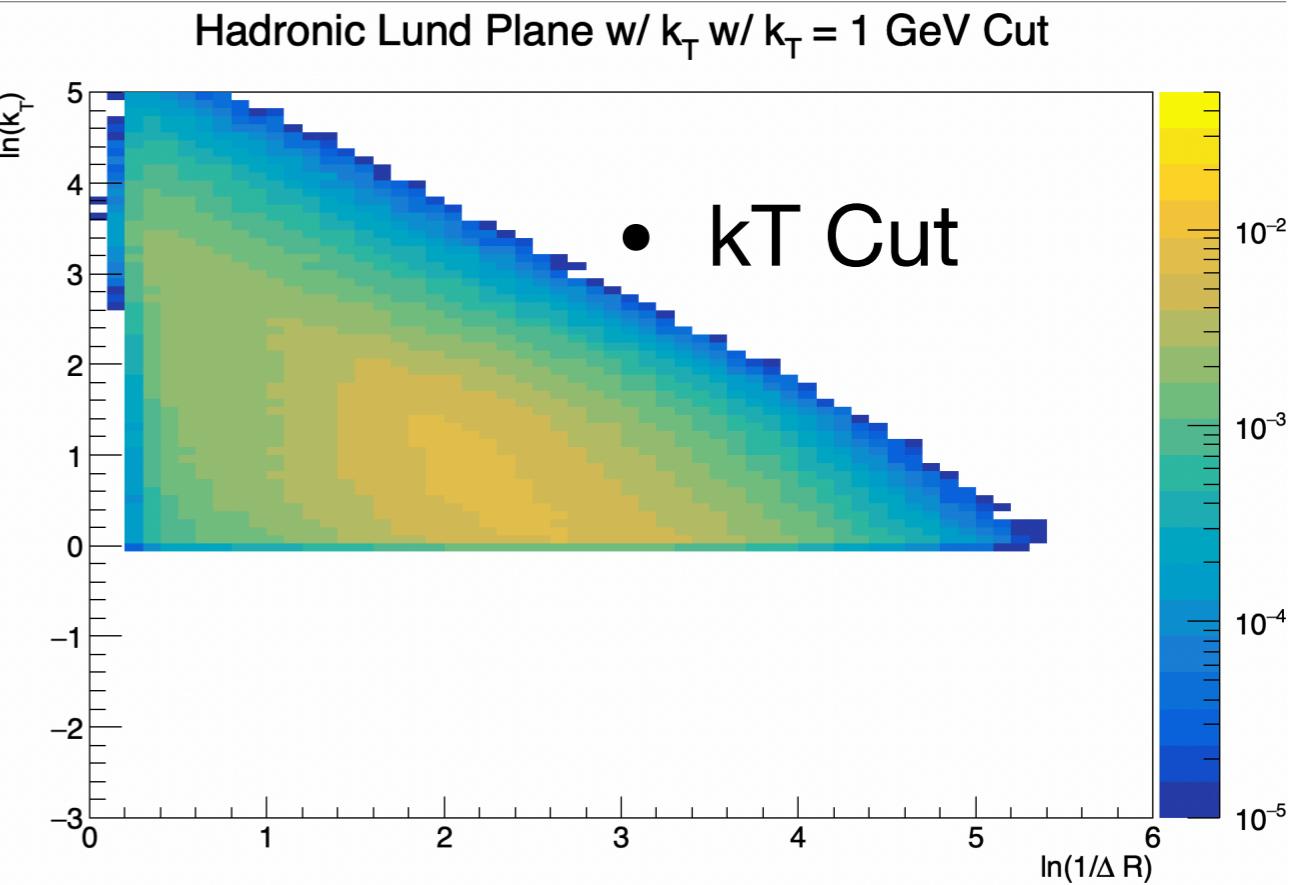
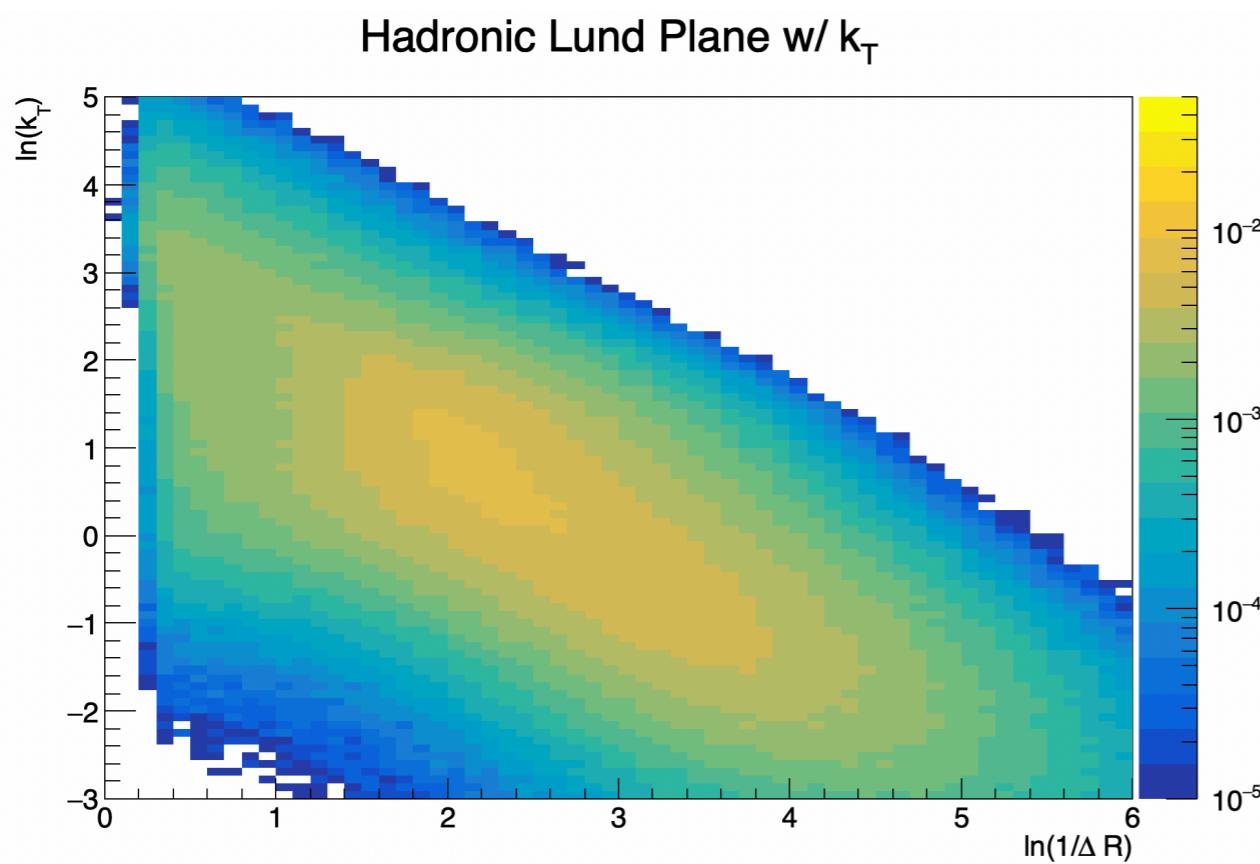
Hadronic Lund Planes w/ C/A



JEWEL+PYTHIA
pp 5 TeV
Jet pT > 70 GeV
anti- k_T R=0.8 Jets

pp Collisions

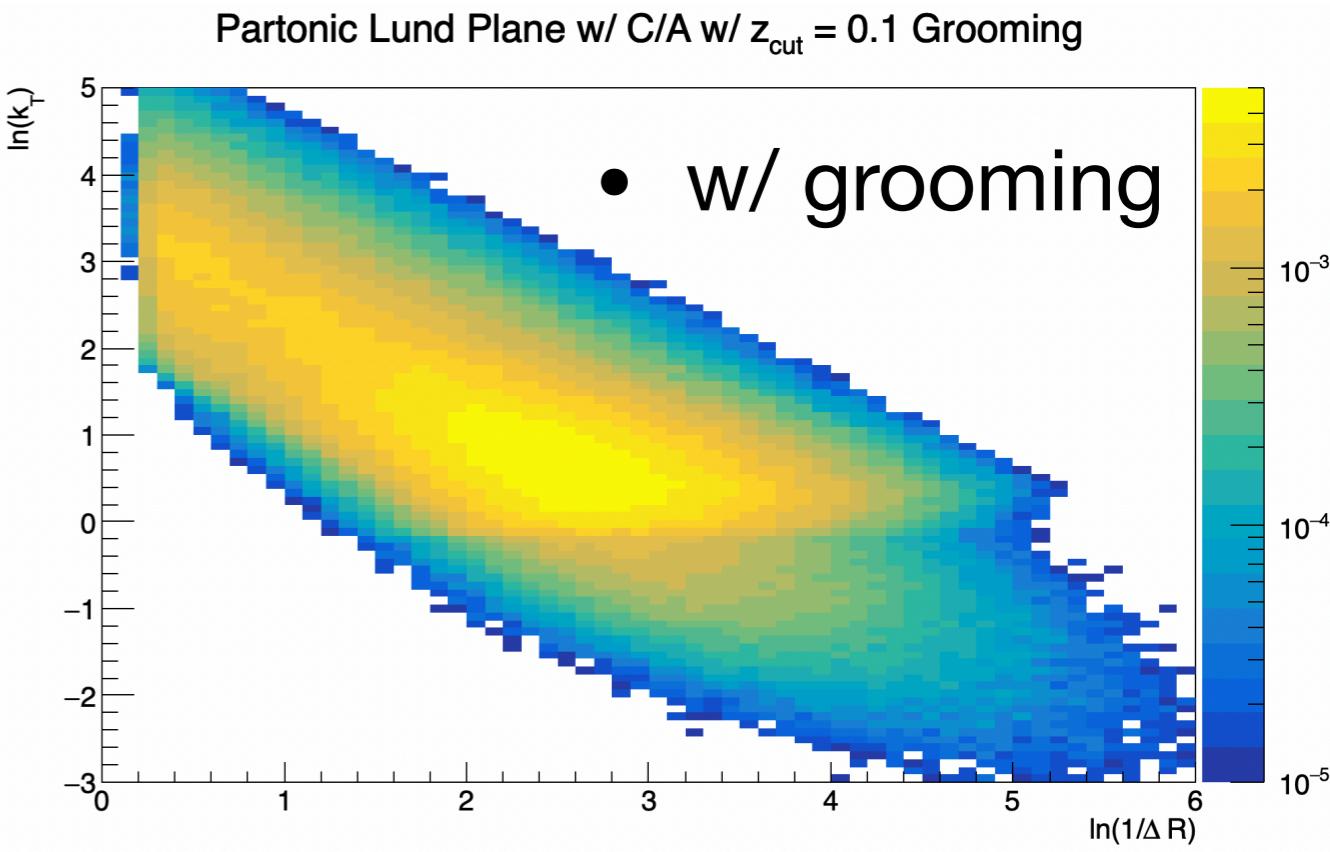
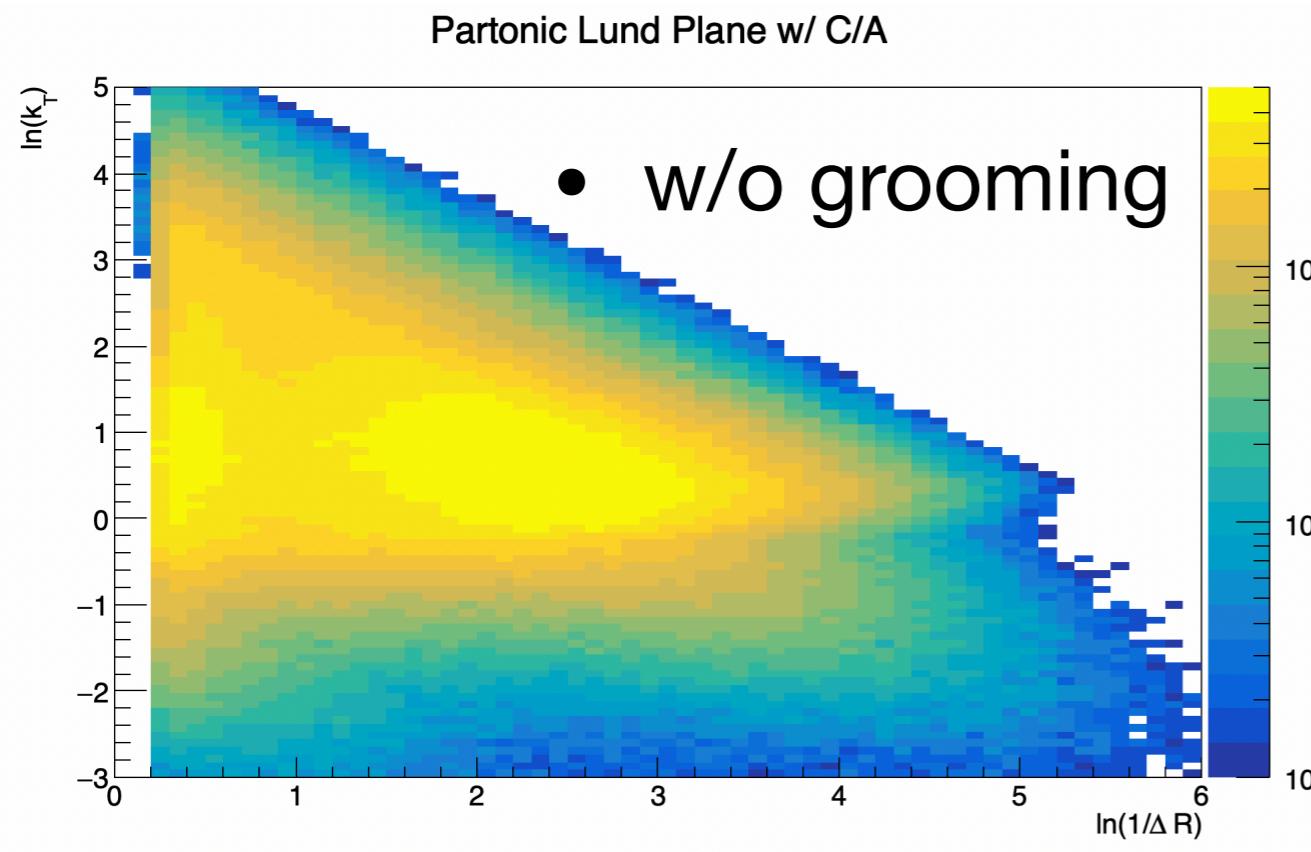
Hadronic Lund Planes w/ k_T



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anti- k_T R=0.8 Jets

pp collisions

Partonic Lund Plane w/ C/A

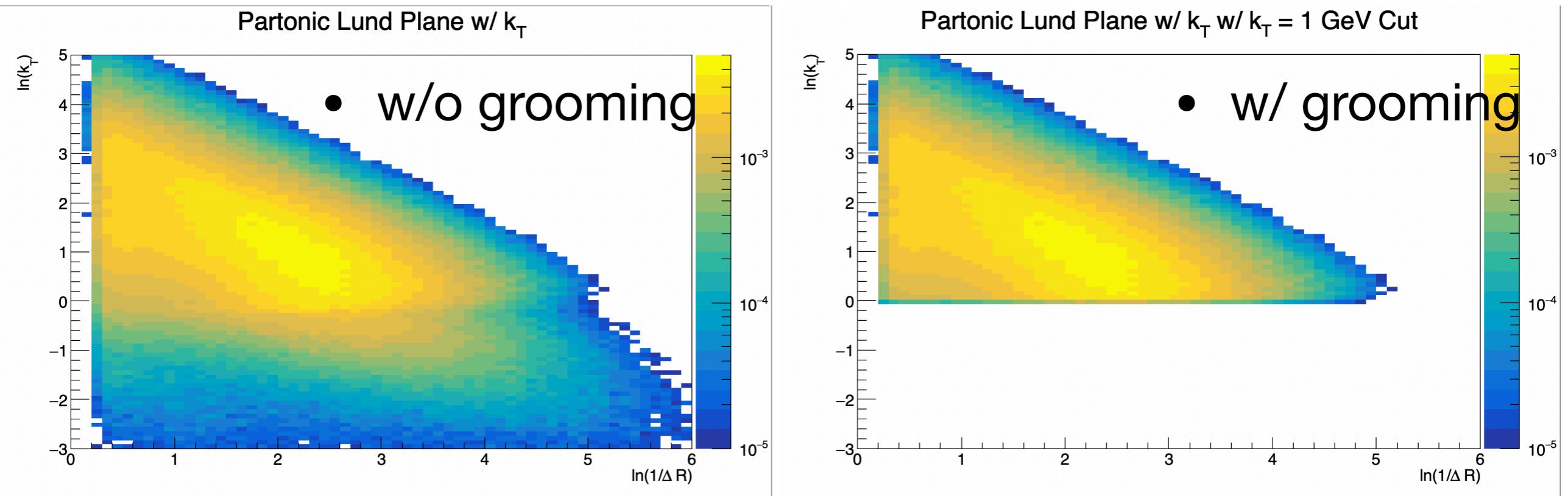


- The parton 4-mom information was incorrectly read from the input file - fixing the bug fixed this artificial dip

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anti-kT R=0.8 Jets

pp collisions

Partonic Lund Plane w/ k_T

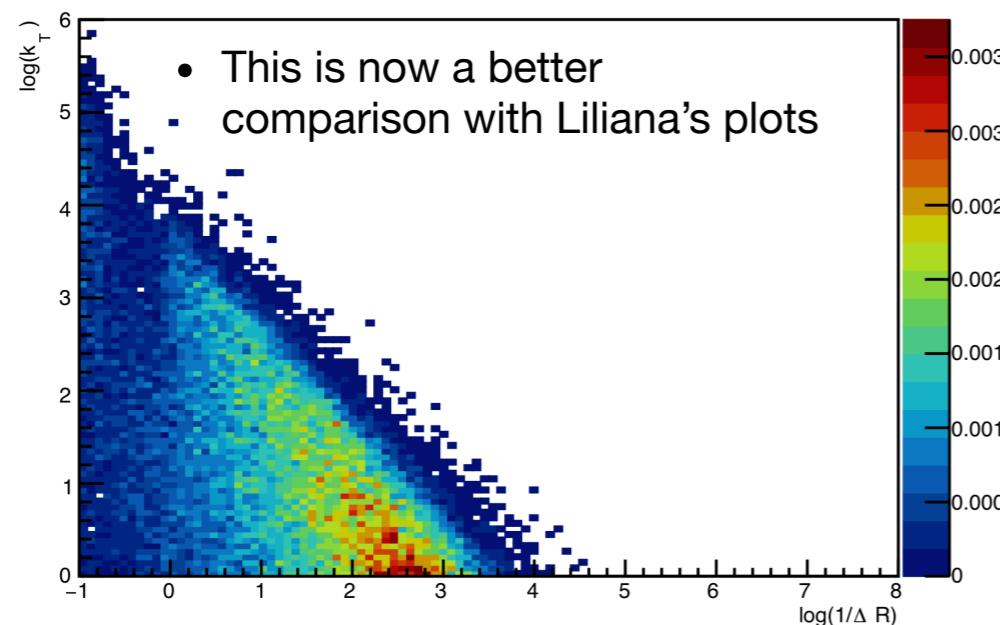
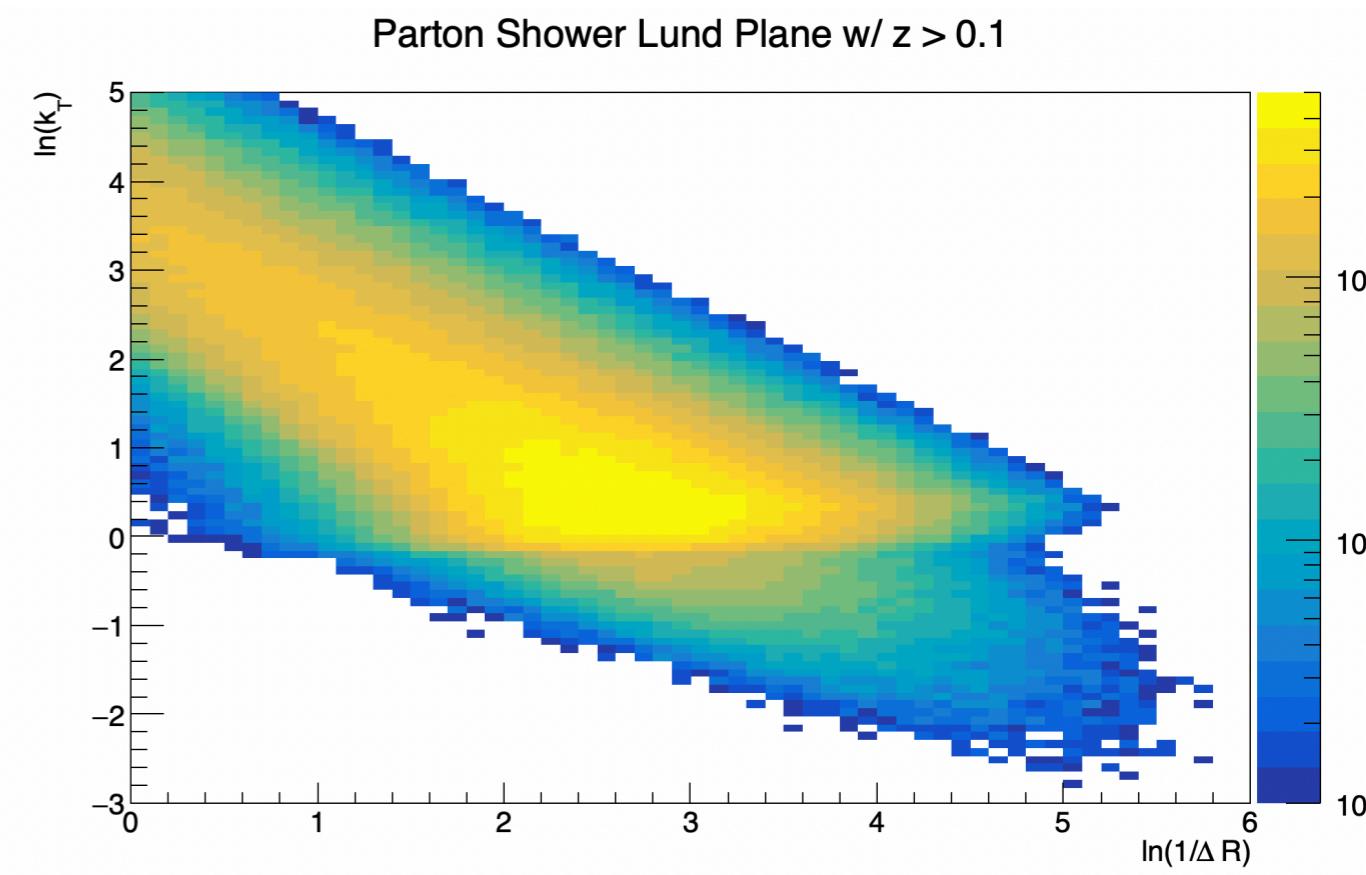
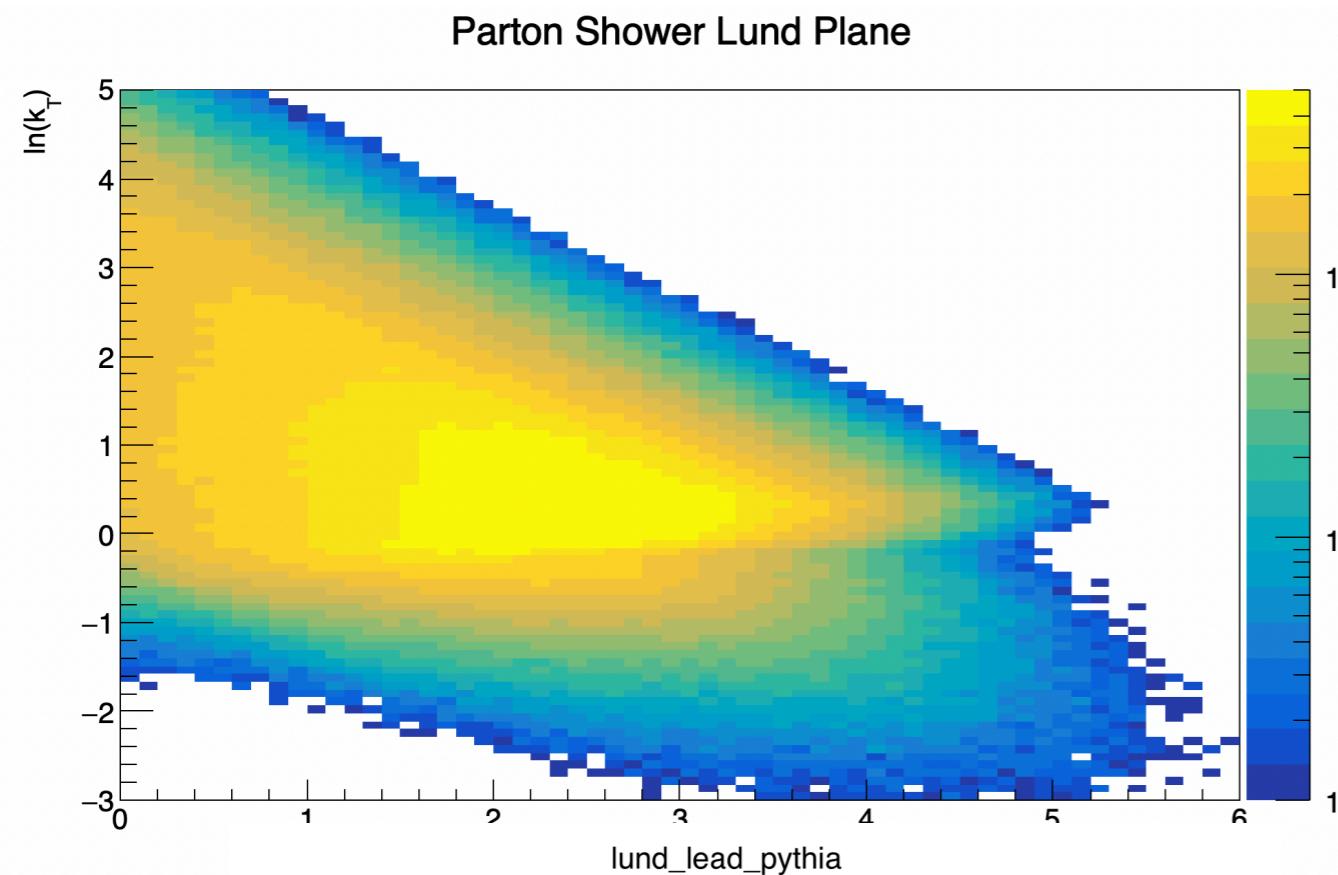


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Jet pT > 70 GeV
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pp collisions

Parton Shower Lund Plane



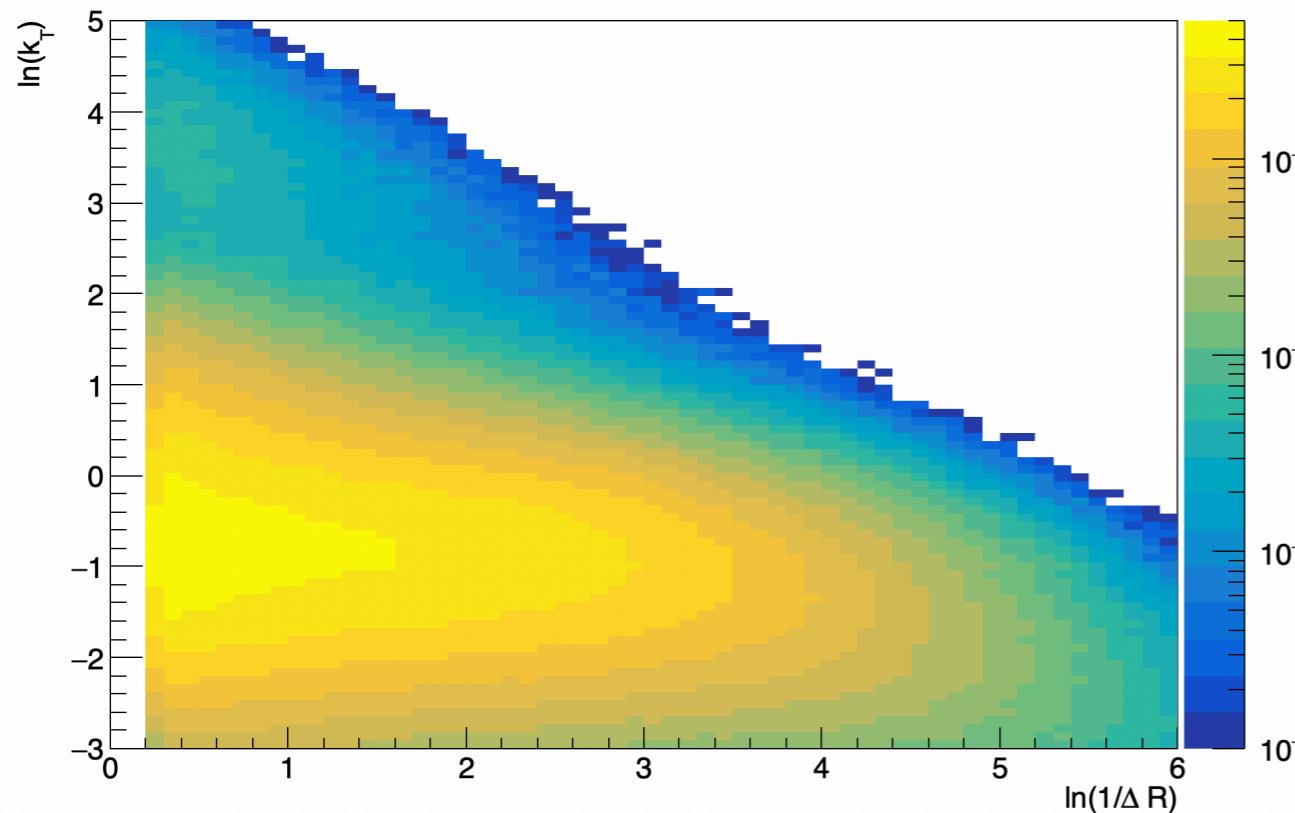
JEWEL+PYTHIA
pp 5 TeV
Jet pT > 70 GeV

Backup

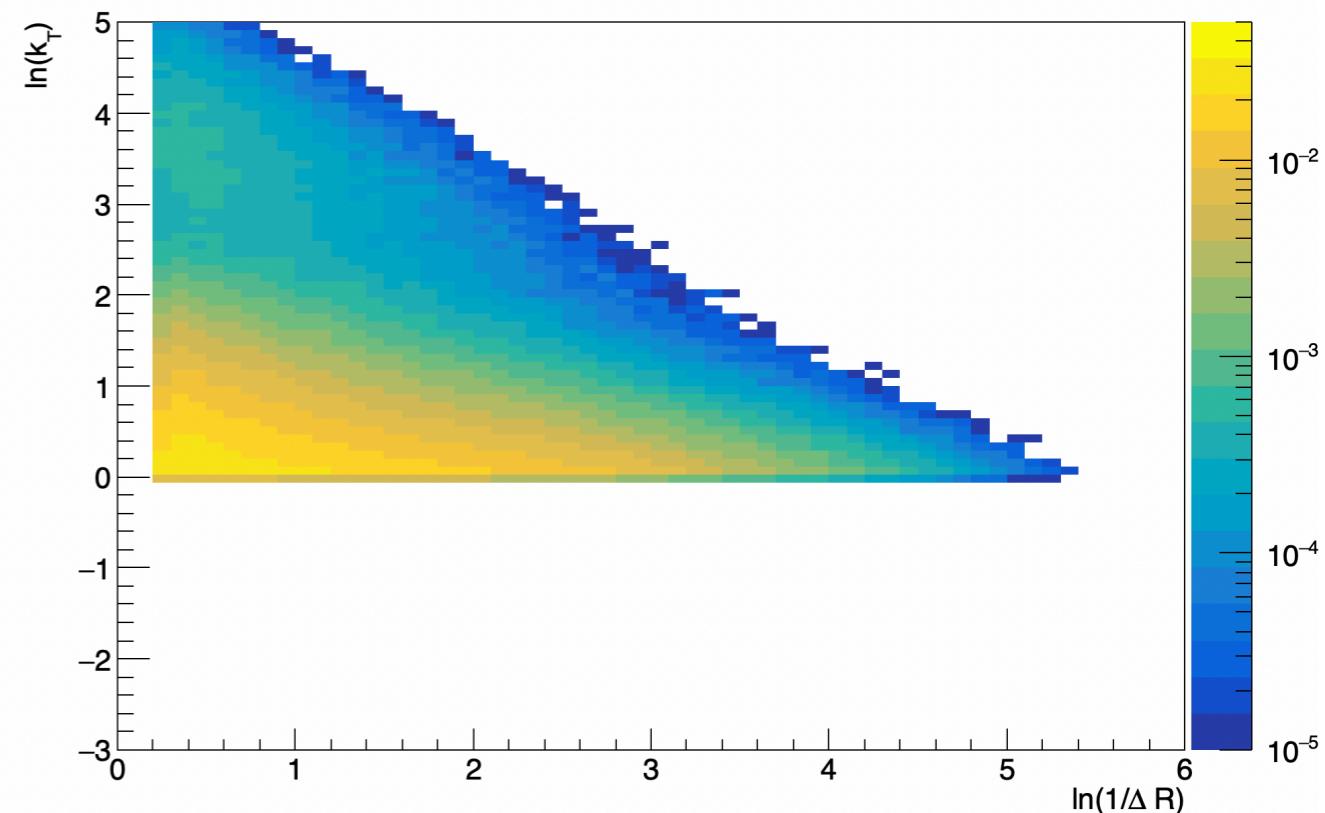
pp Collisions

Hadronic Lund Planes w/ akT

Hadronic Lund Plane w/ anti- k_T



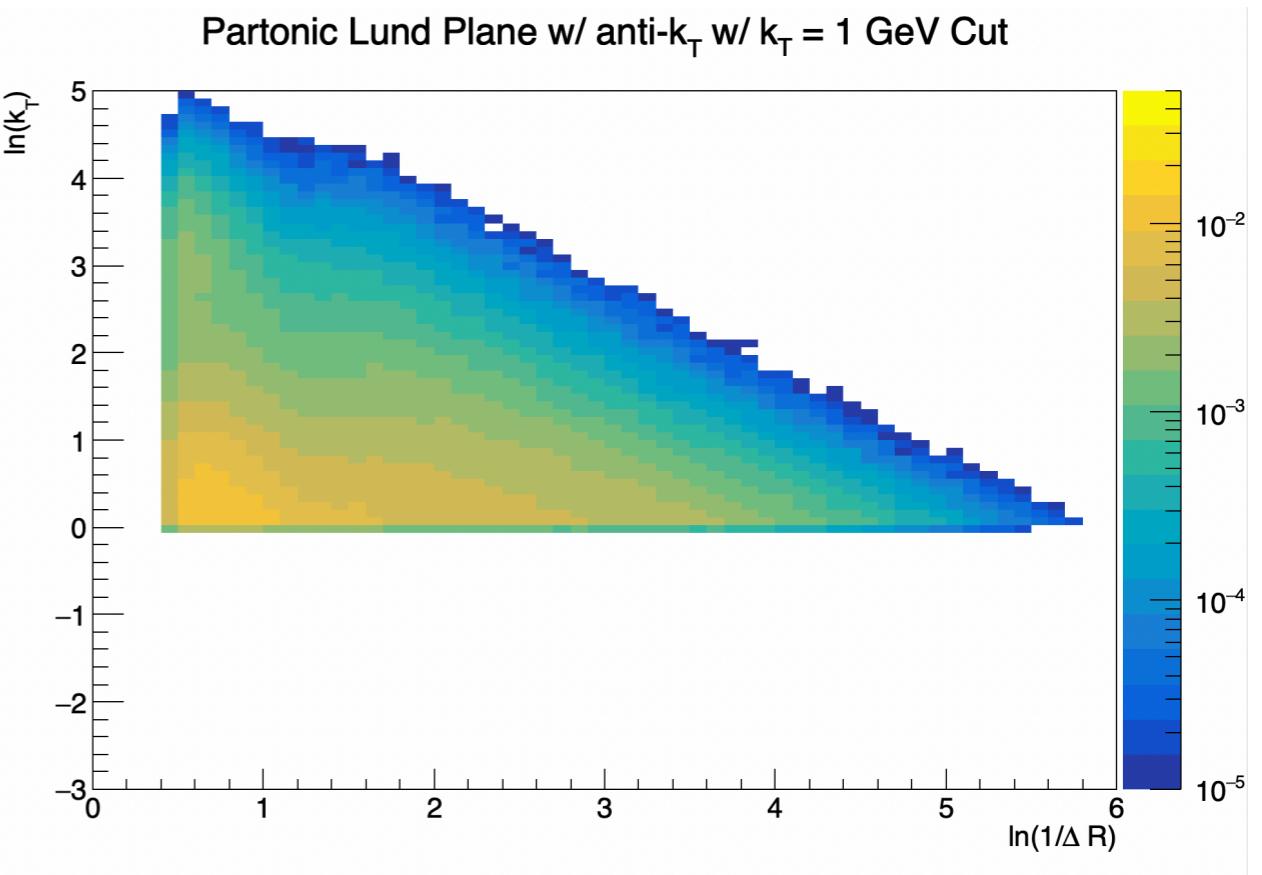
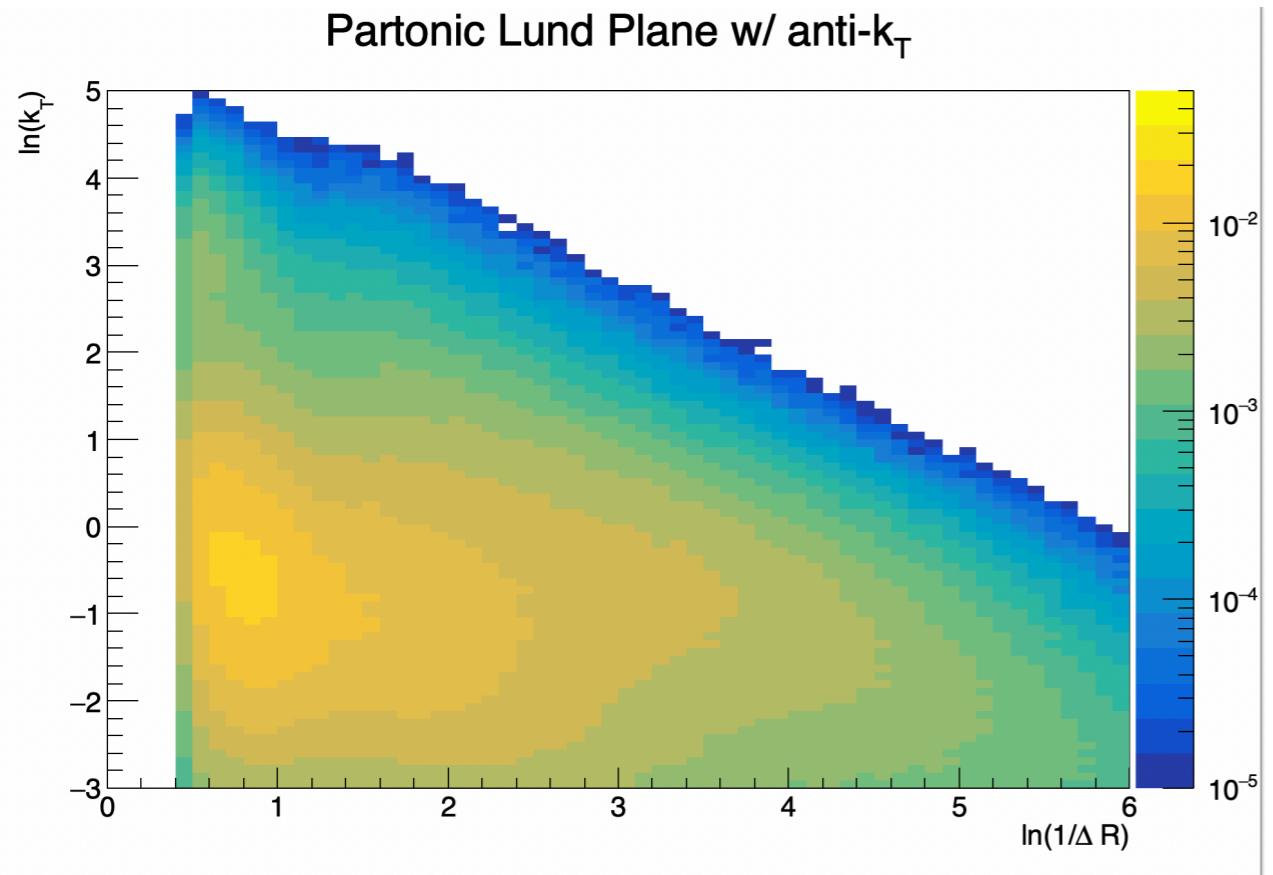
Hadronic Lund Plane w/ anti- k_T w/ $k_T = 1$ GeV Cut



JEWEL+PYTHIA
pp 5 TeV
Jet pT > 70 GeV
anti- k_T R=0.8 Jets

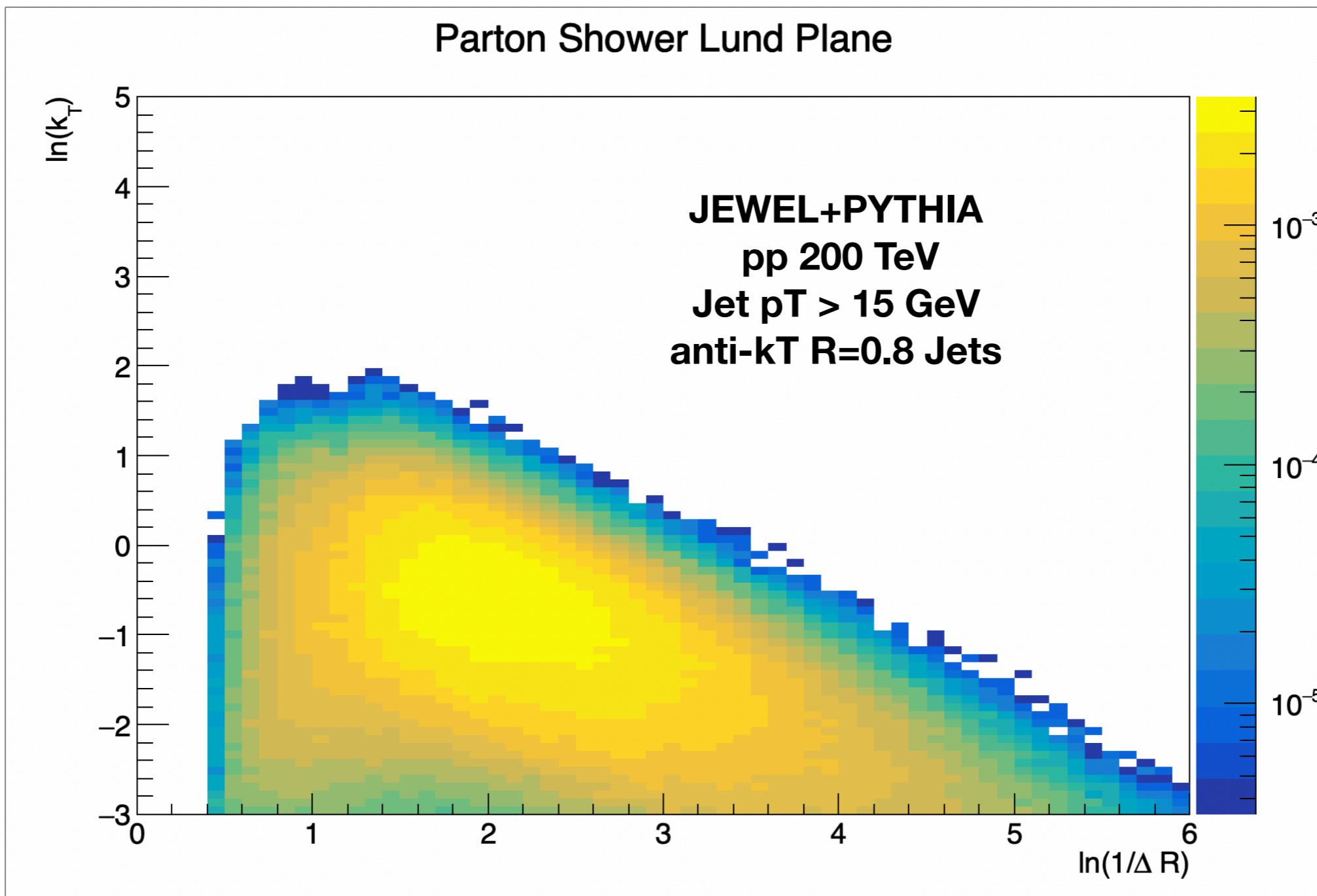
pp Collisions

Partonic Lund Planes w/ akT

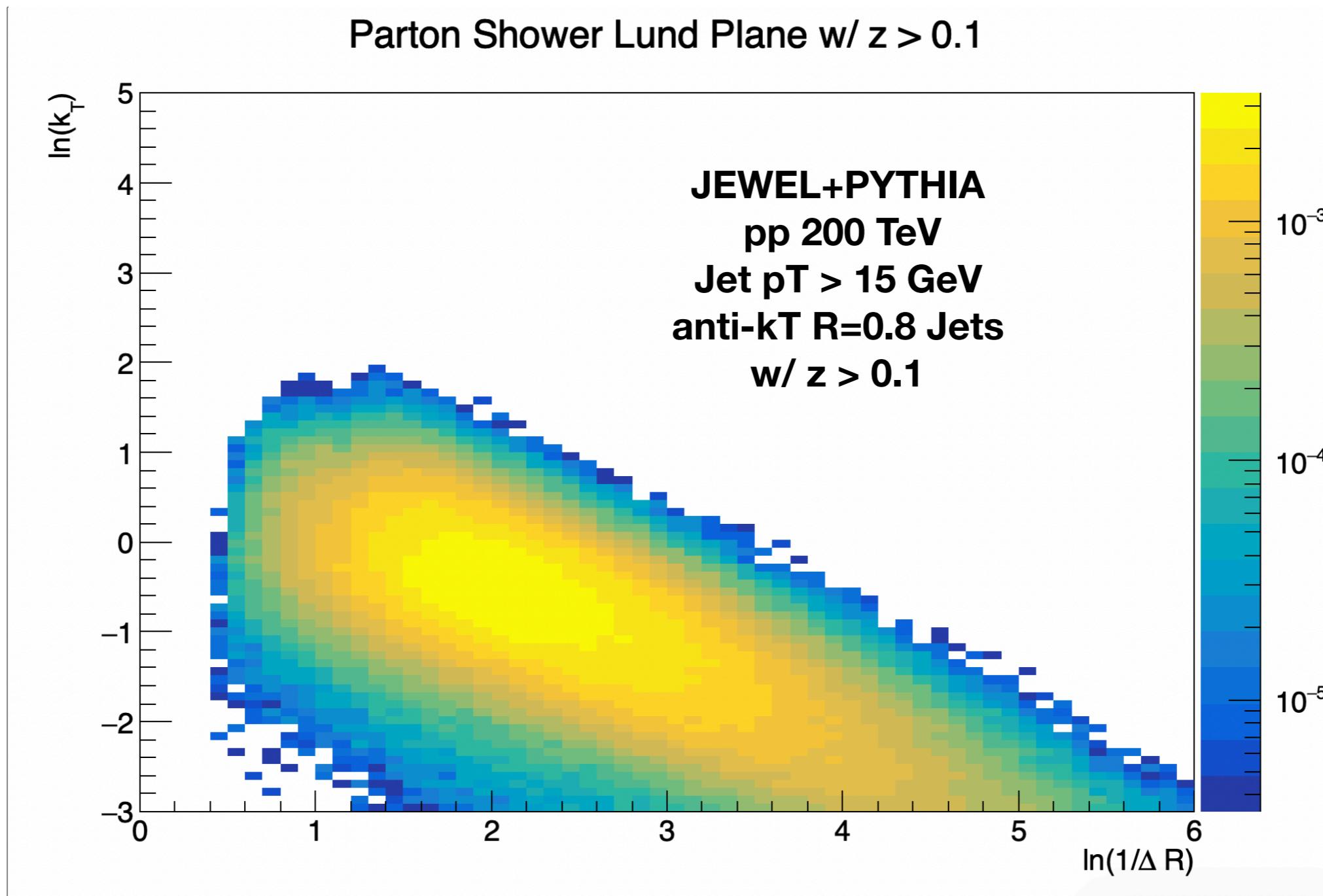


JEWEL+PYTHIA
pp 5 TeV
Jet pT > 70 GeV
anti- k_T R=0.8 Jets

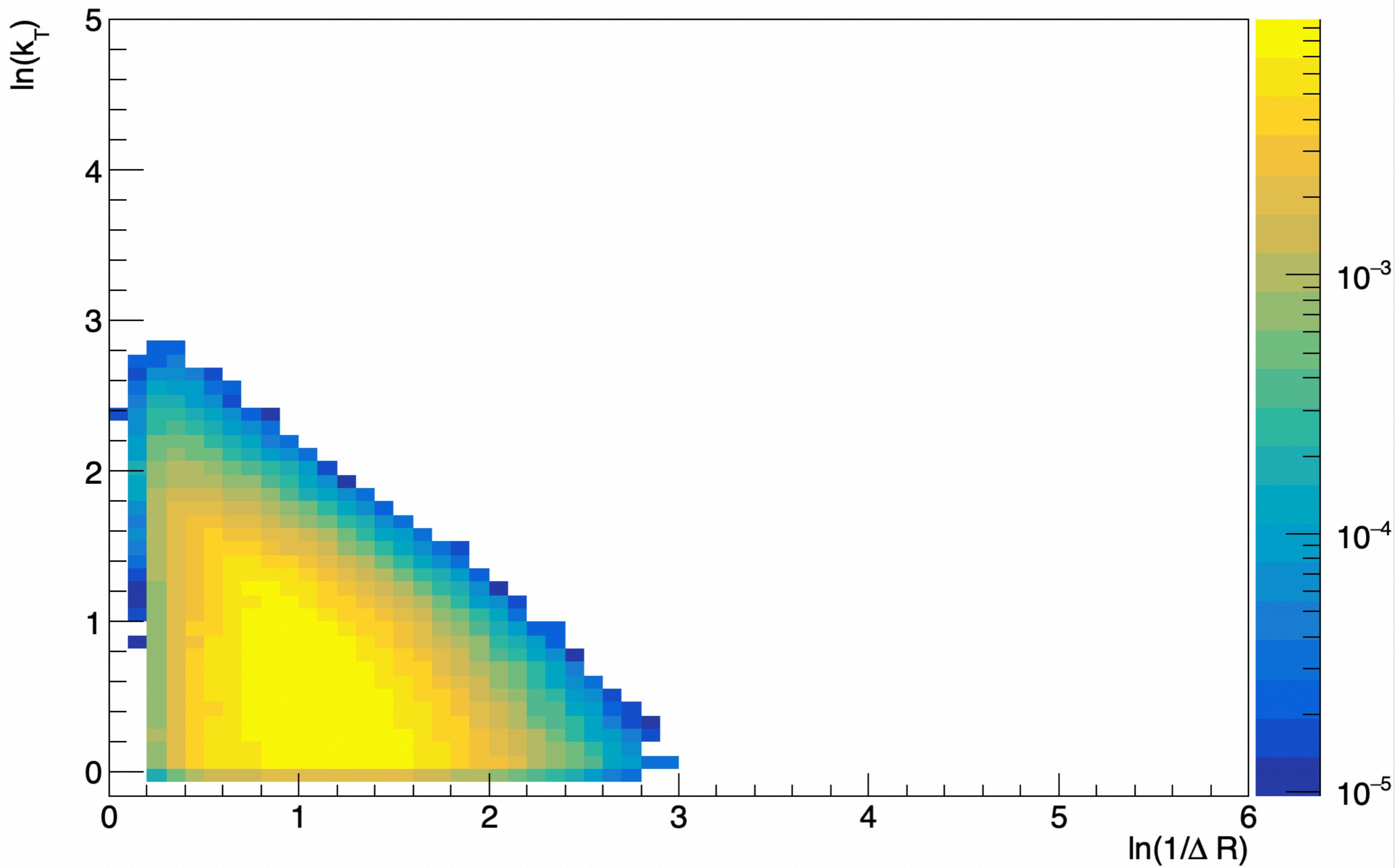
pp @ 200 GeV



pp @ 200 GeV



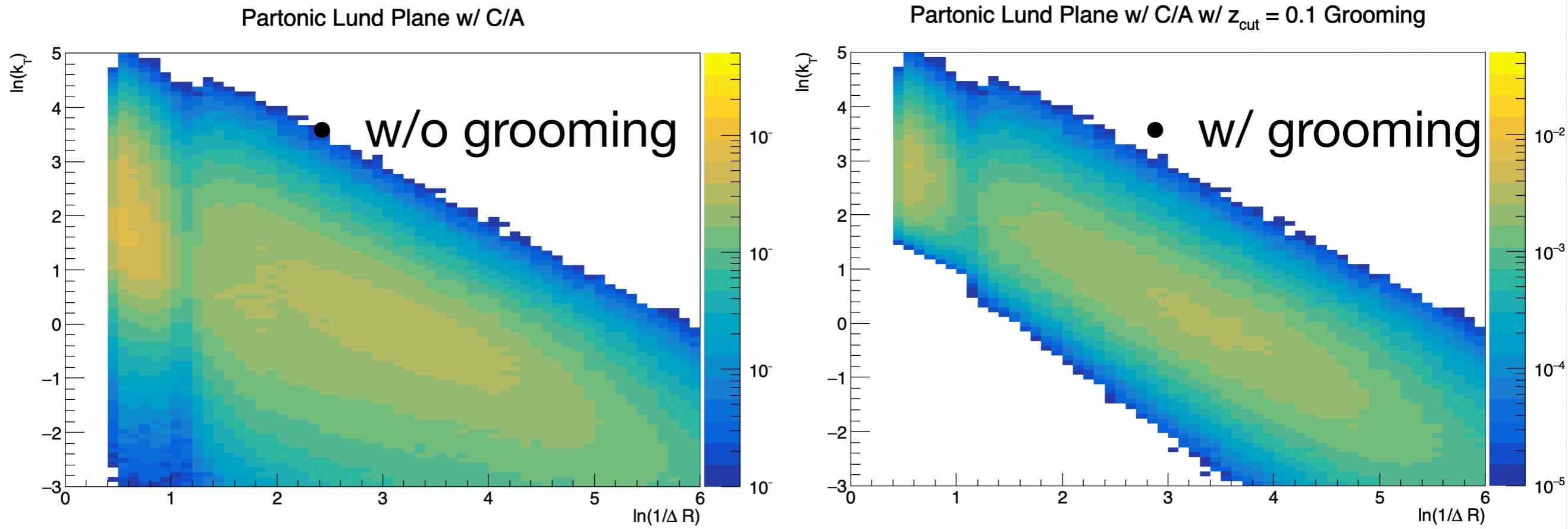
Hadronic Lund Plane w/ k_T w/ $k_T = 1$ GeV Cut



Old Parton level curves with Bug

pp collisions

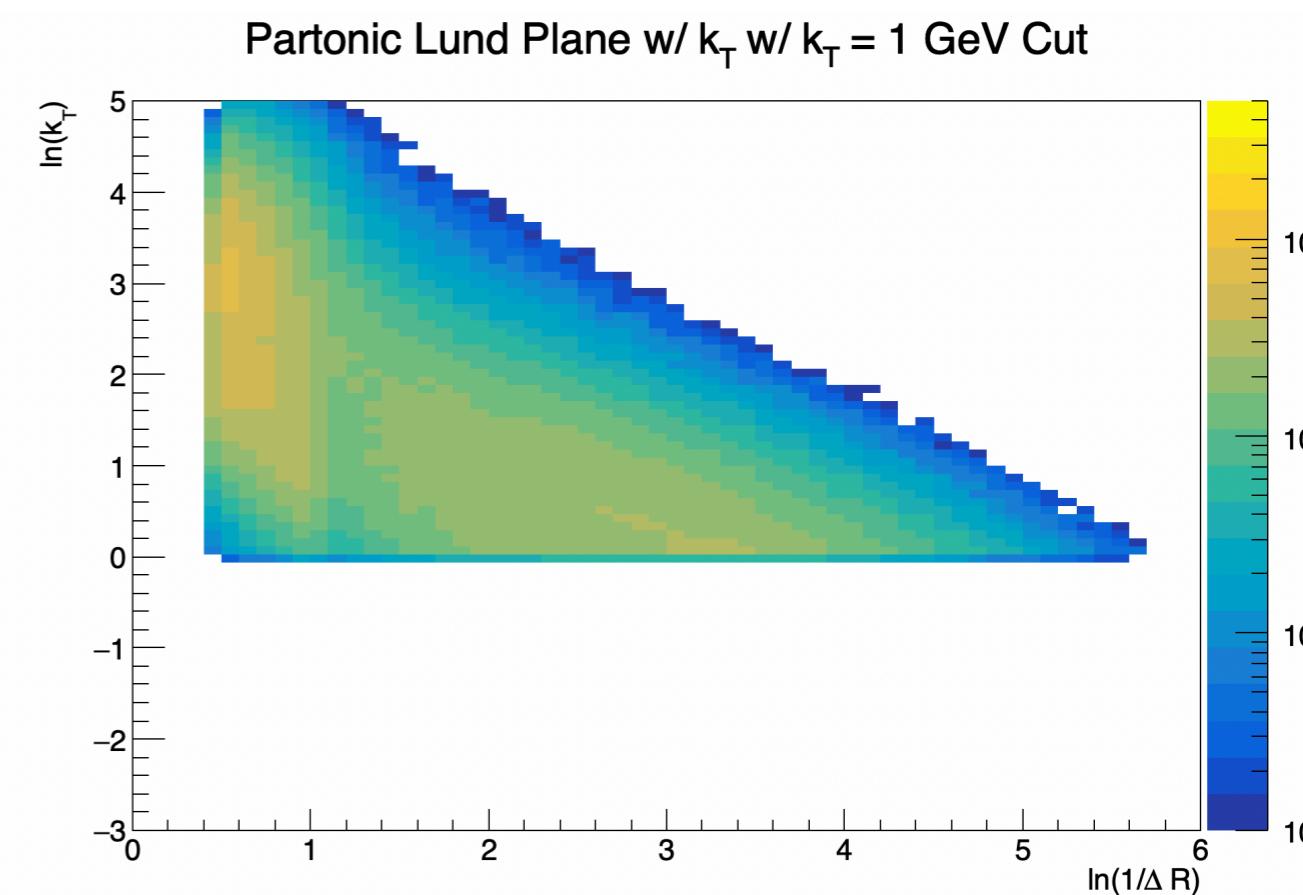
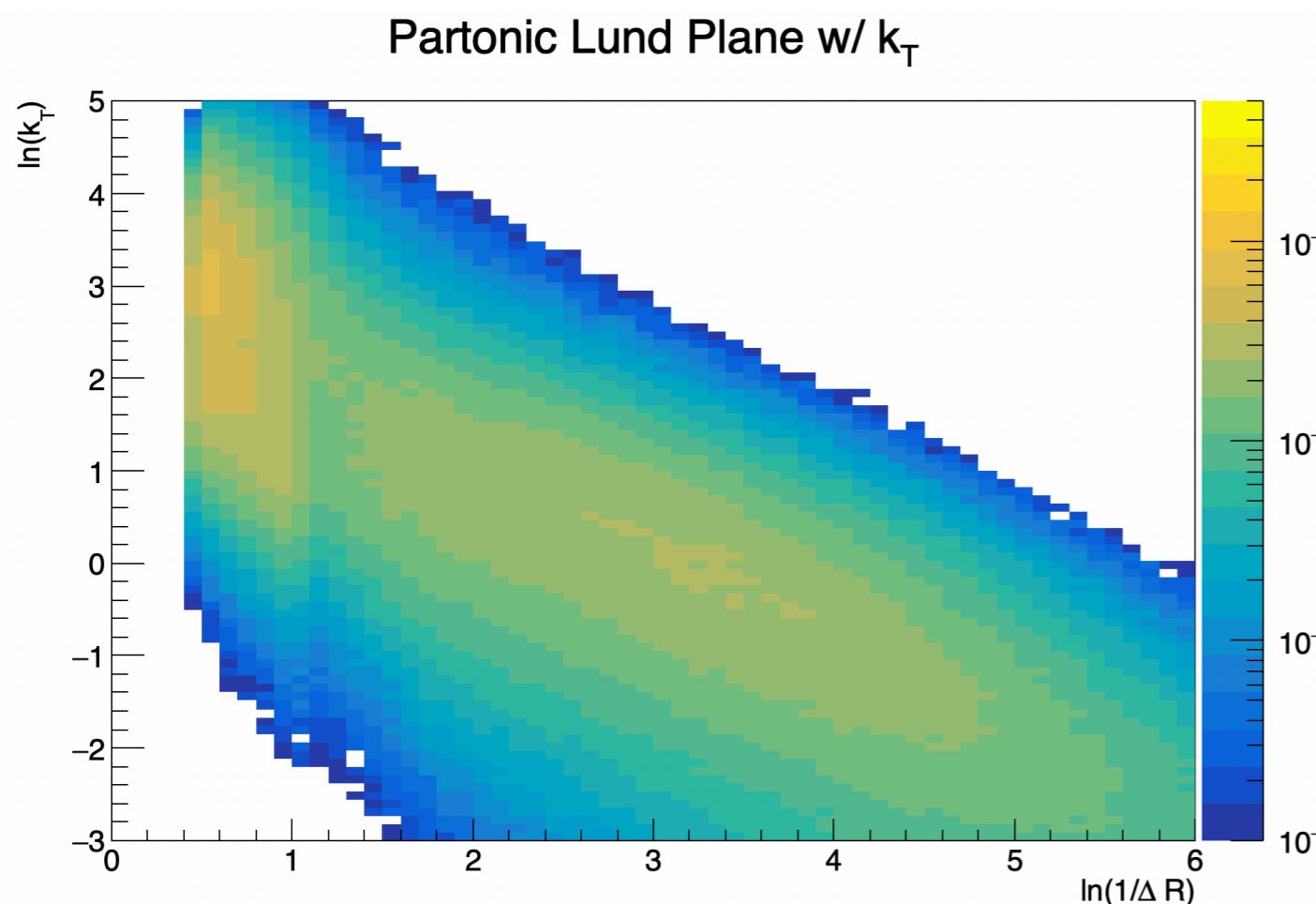
Partonic Lund Plane w/ C/A



JEWEL+PYTHIA
pp 5 TeV
Jet pT > 70 GeV
anti-kT R=0.8 Jets

pp collisions

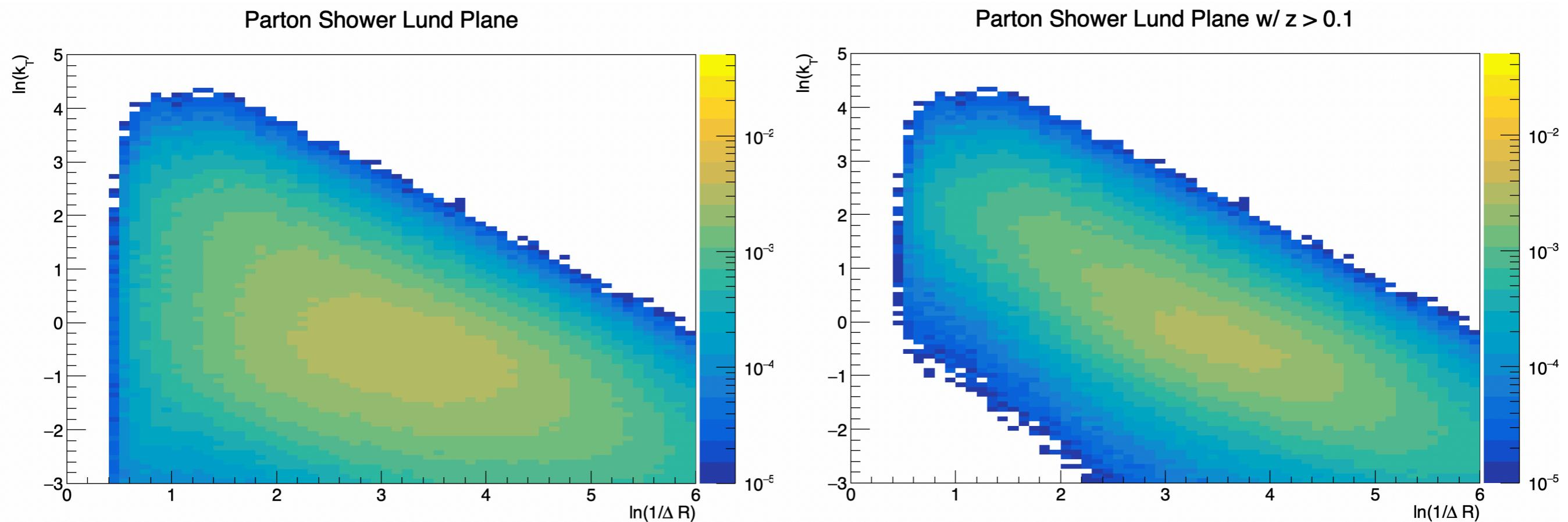
Partonic Lund Plane w/ k_T



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anti- k_T R=0.8 Jets

pp collisions

Parton Shower Lund Plane



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