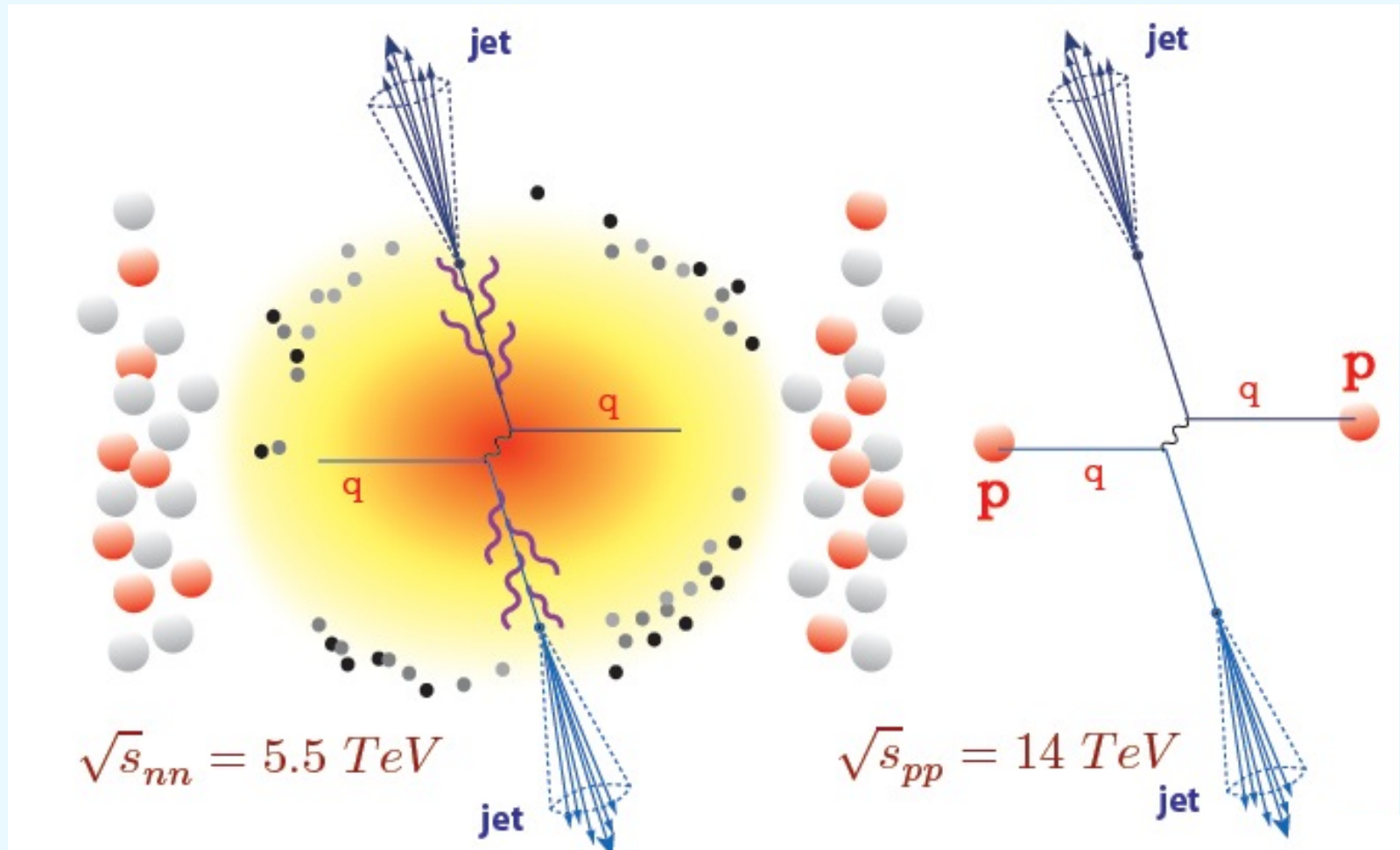
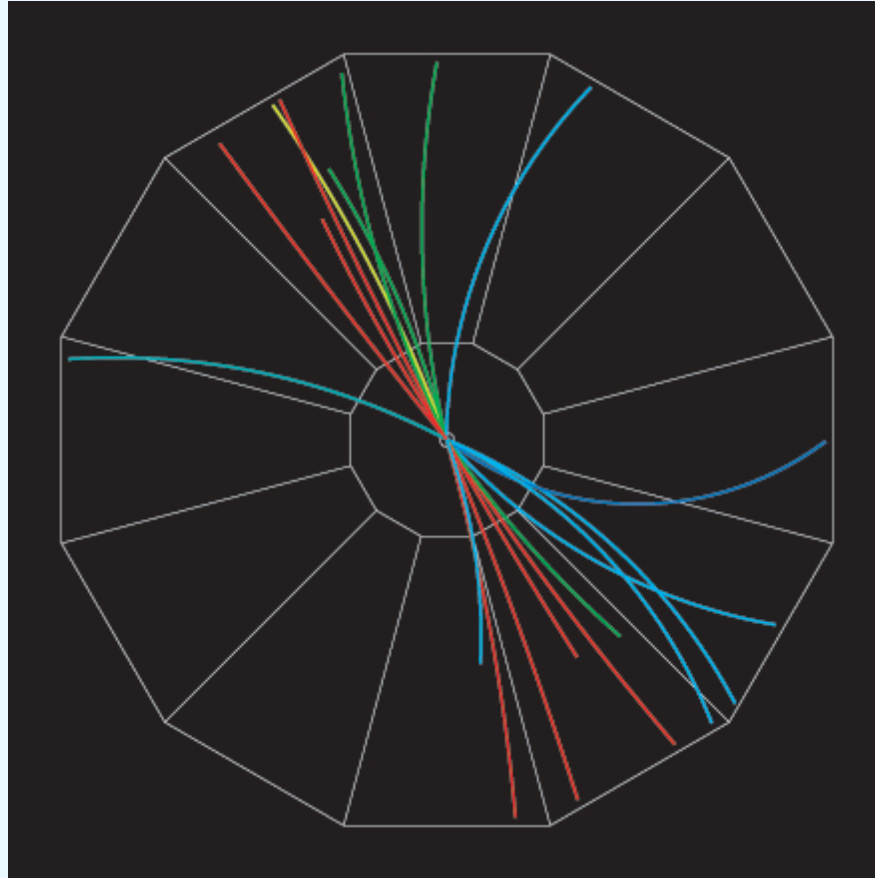


Jets + Homework 4

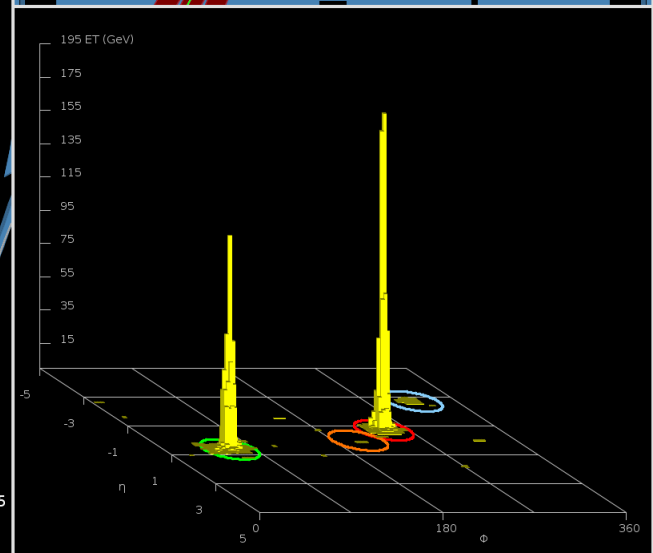
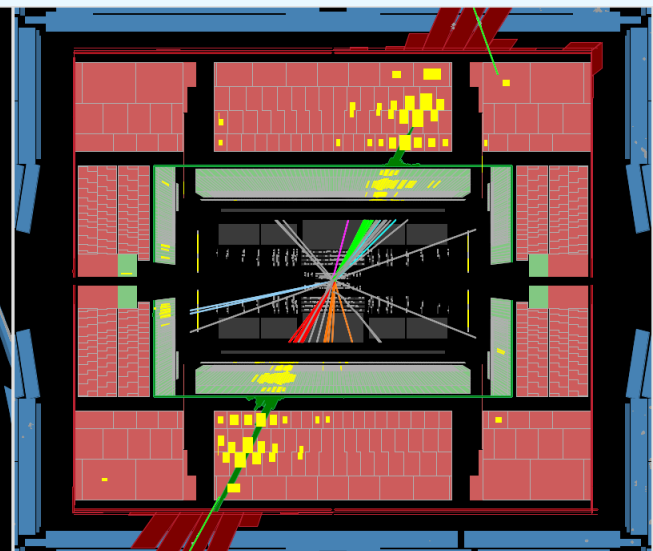
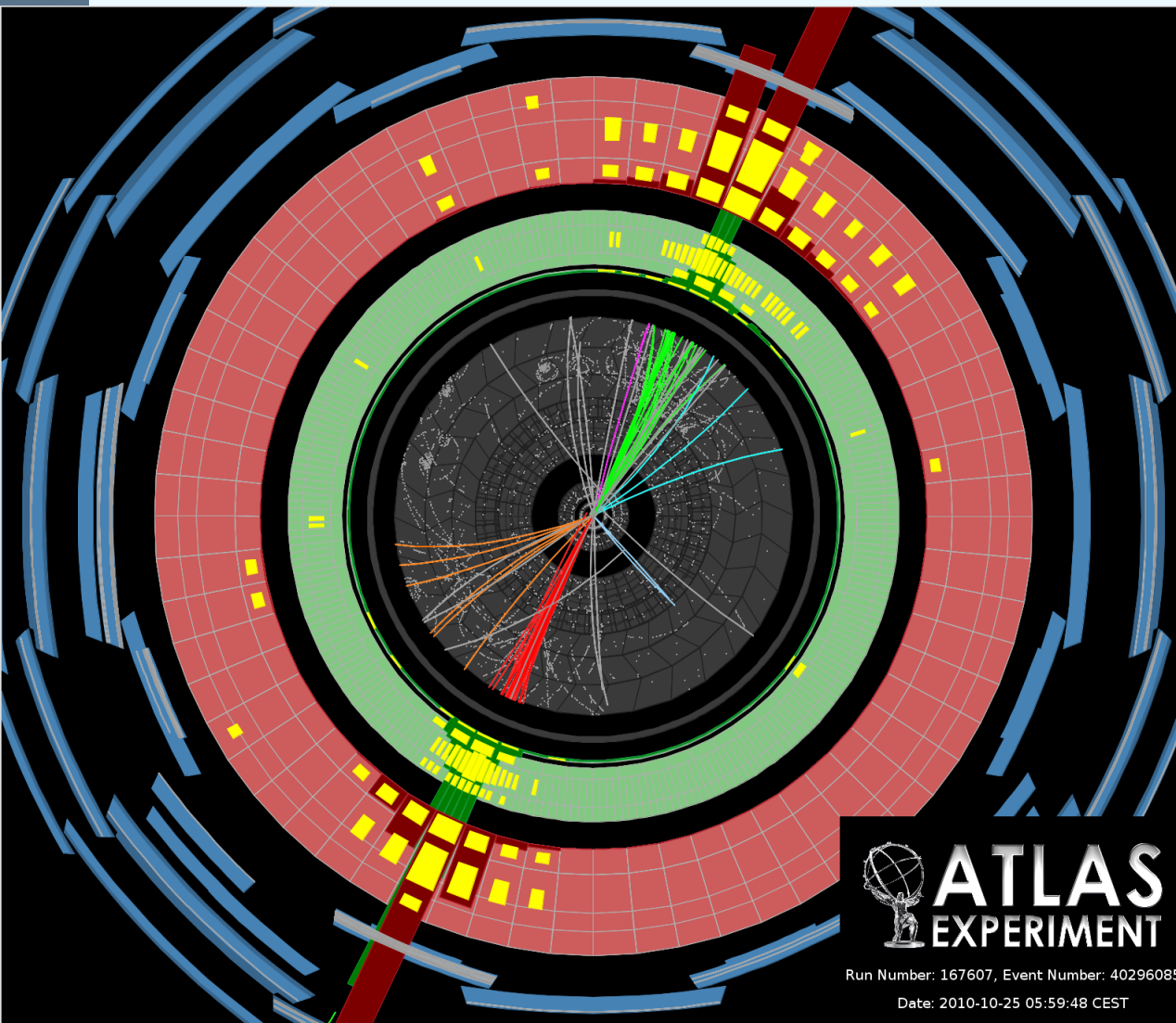
Jets in p+p and A+A



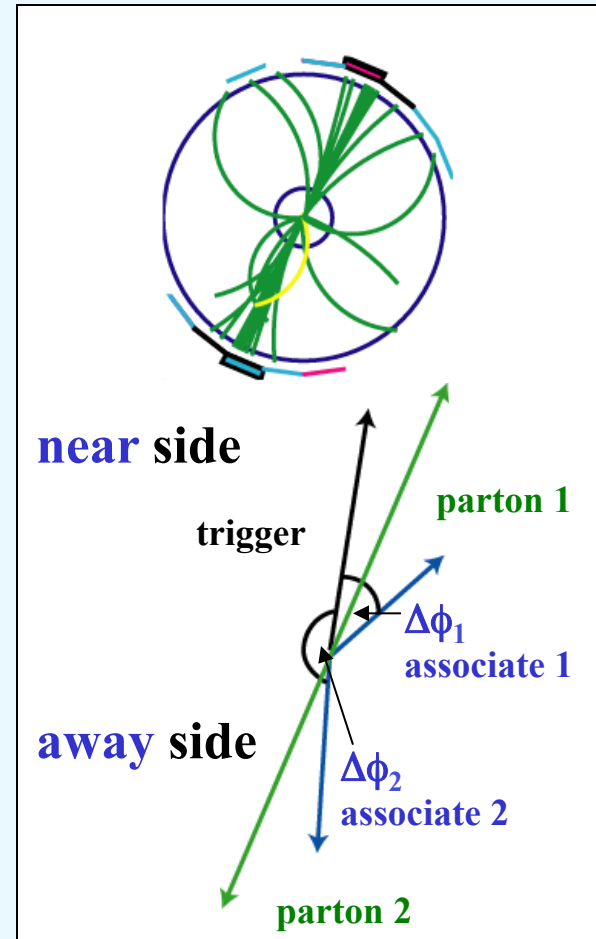
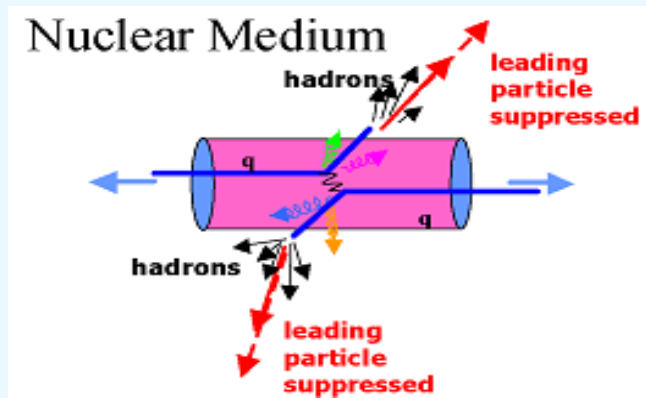
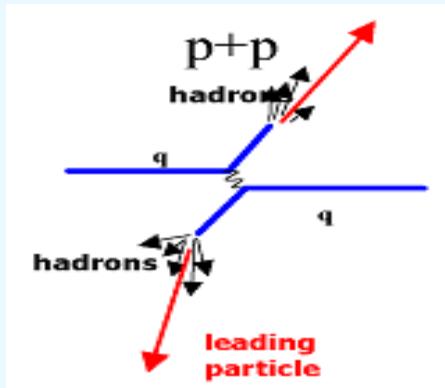
2-Jet event in p+p at $\sqrt{s} = 200\text{GeV}$ (STAR)



2-Jet event in p+p at $\sqrt{s} = 7$ TeV (ATLAS)



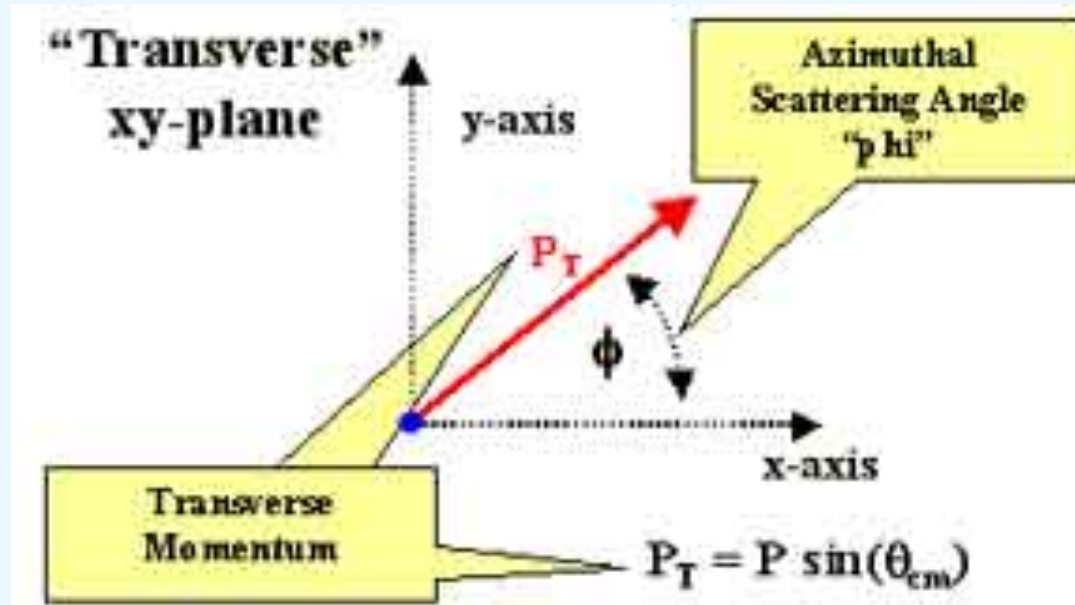
Azimuthal-Correlation



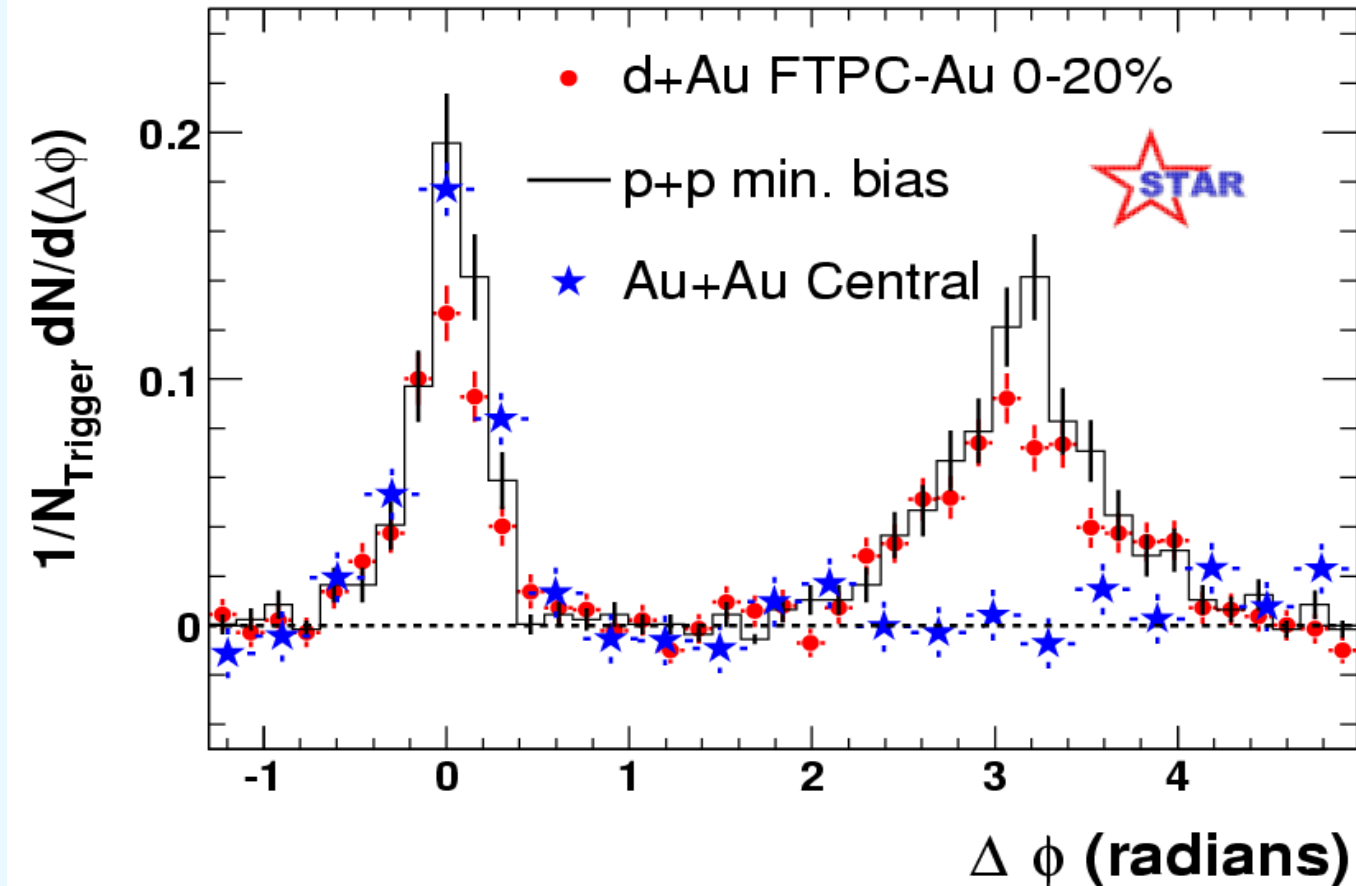
Kinematic Variables

Transverse momentum p_T :

$$p_T = \sqrt{p_x^2 + p_y^2}$$



Azimuthal-Korrelationen: RHIC Daten



Trigger Teilchen: 4.0 – 6.0 GeV/c

Assoziierte Teilchen: 2.0 – 4.0 GeV/c

Homework 4: due day April 27

I created 200 Pythia events p+p at 7 TeV (30 GeV/c hard scattering)

→ ascii file of all charged pions

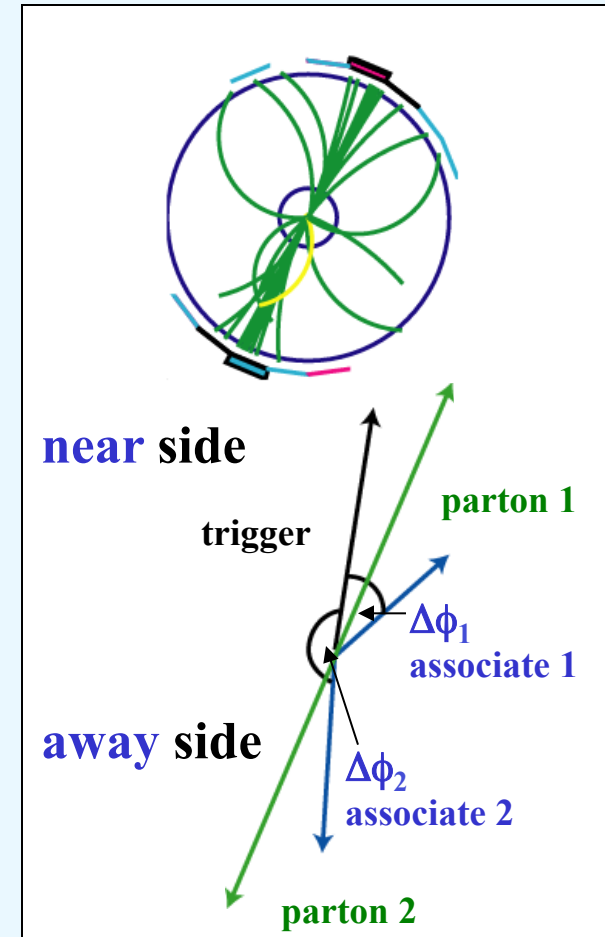
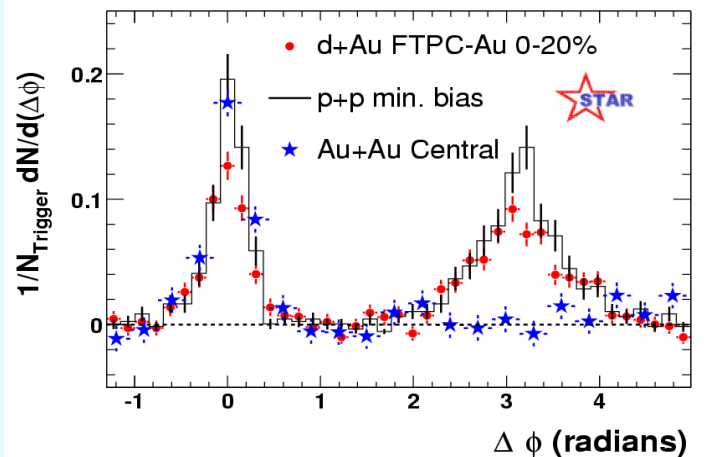
Particle event px py pz:

```
1 1 19.2119 -16.9473 46.836
2 1 2.68818 -2.22436 5.56438
3 2 -0.245131 0.252693 -0.176406
4 2 0.81093 -0.684846 1.60133
5 2 -0.137333 0.218012 -0.495384
6 3 -1.44181 0.977279 -3.12299
```

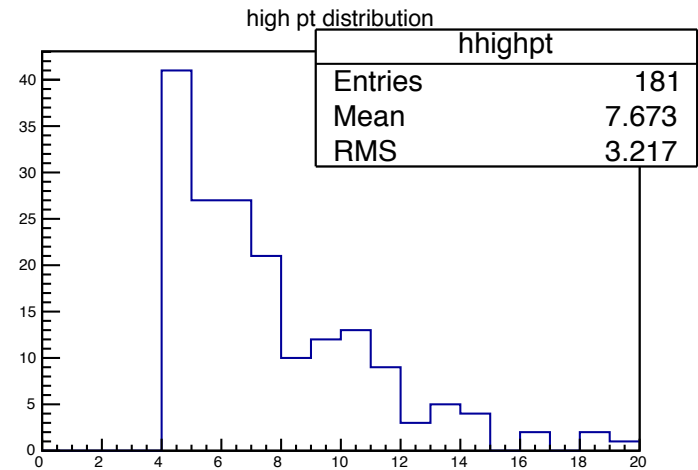
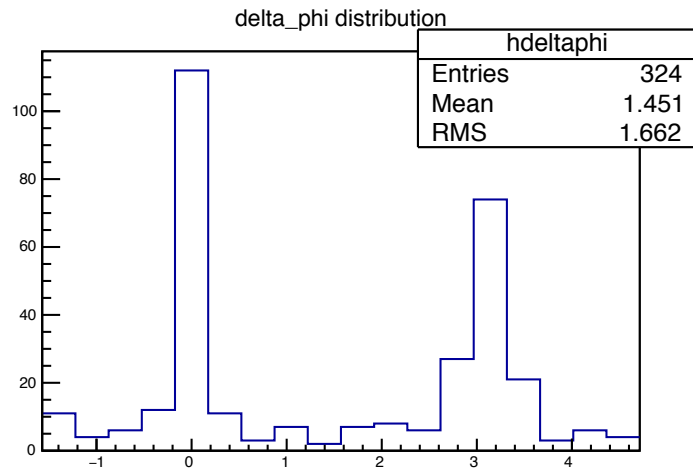
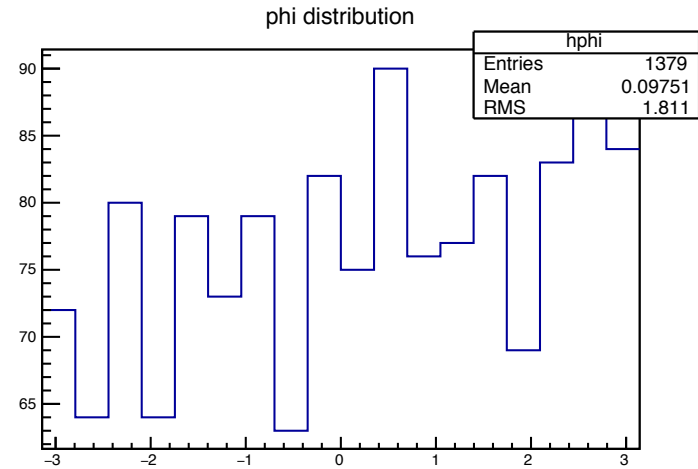
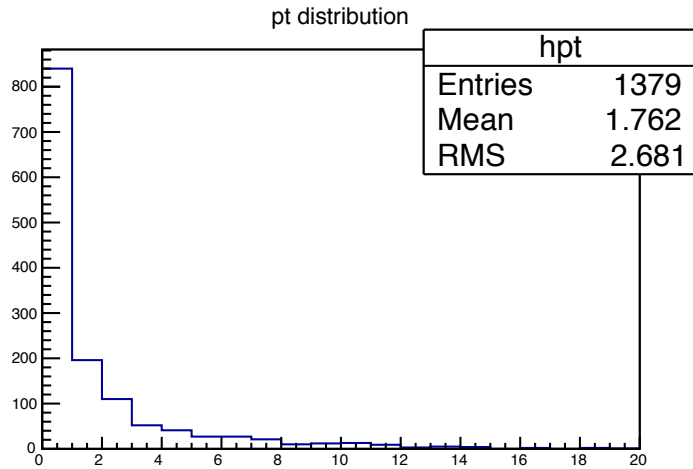
200 events, 1379 charged pions

Homework 4: due day April 27

- 1.) calculate and plot p_t distribution of all pions
- 2.) calculate and plot ϕ angle in p_t plane of all pions
- 3.) calculate and plot ϕ angle difference between high trigger p_t particle $p_t > 4$ GeV/c and low p_t associated particle $1 < p_t < 4$ GeV/c
- 4.) How many particles are in a jet ?
(hint: jet identification is one particle with $p_t > 4$ GeV/)

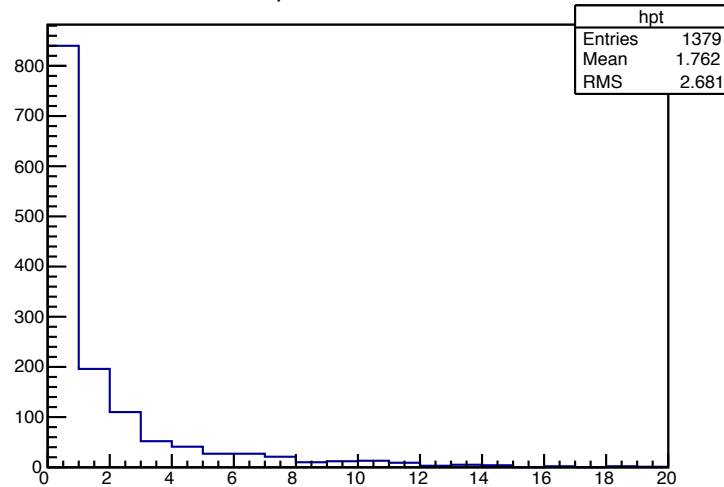


Homework 4: due day April 27

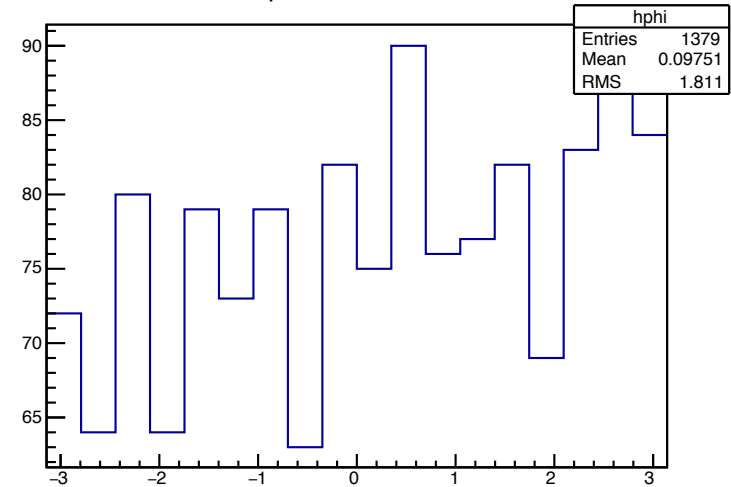


Homework 4: associated particle pt = [0,4] GeV

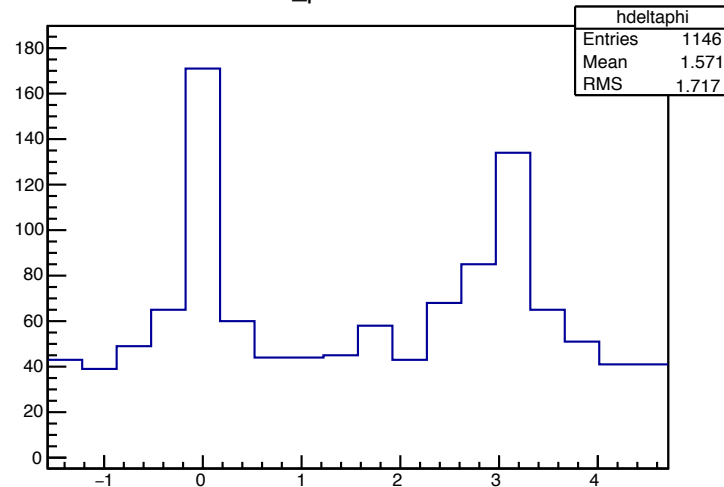
pt distribution



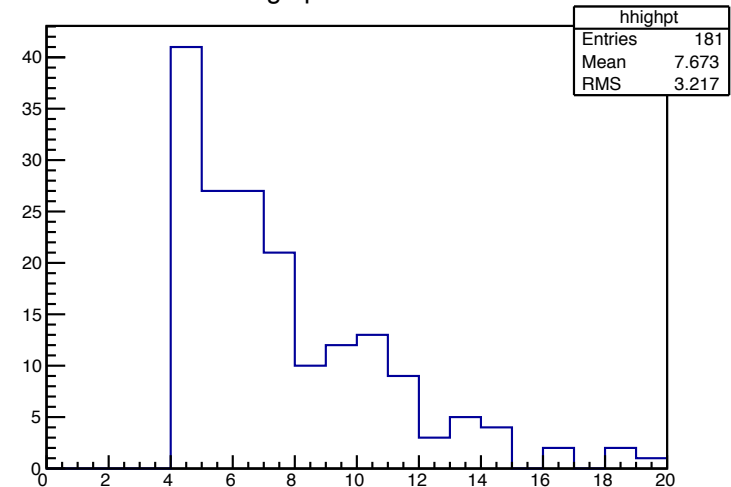
phi distribution



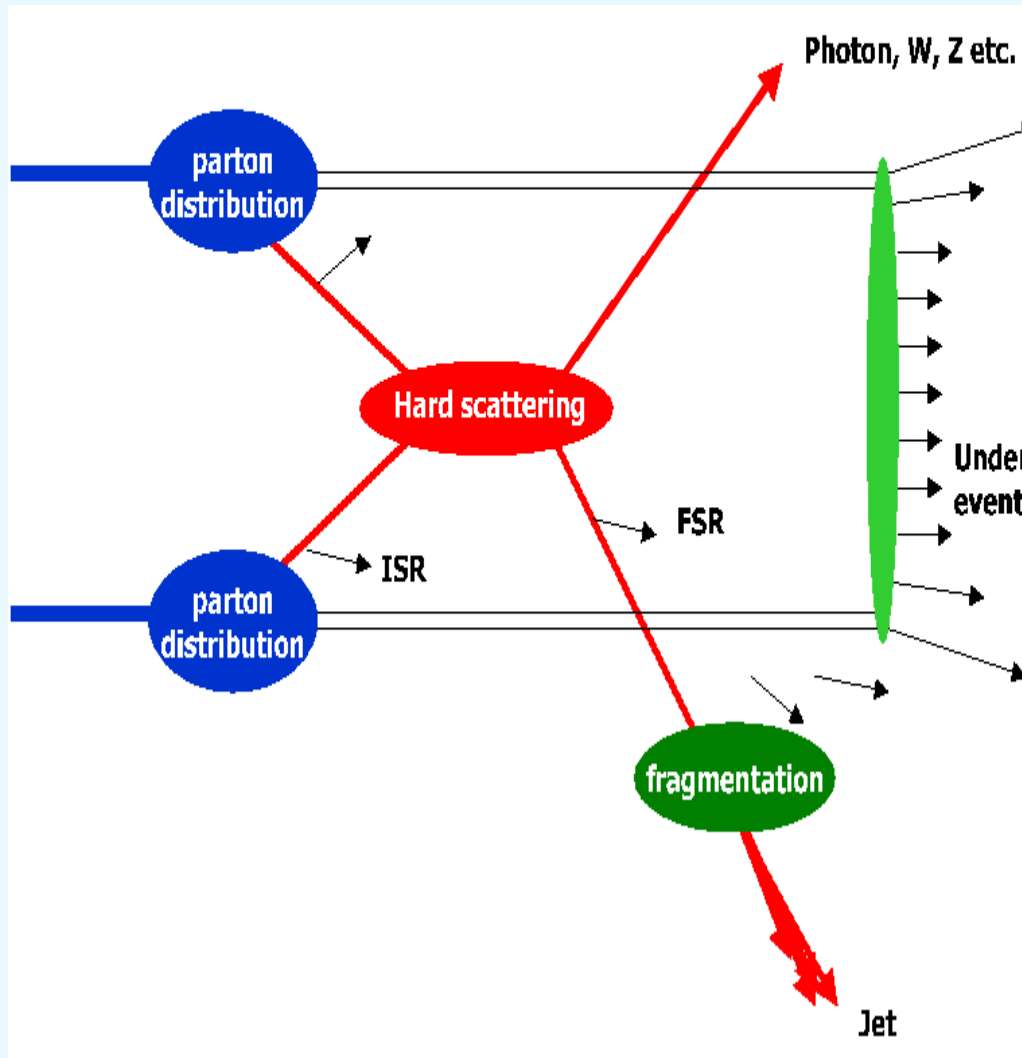
delta_phi distribution



high pt distribution



Underlying event in p+p events



Undergraduate (3rd year) Summer Program 2015

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