

First Results: Multiplicity of Negative Hadrons

Van der Meer Scan

Beam displacement of 100um per step (beam size 500um)

Record ZDC counts in each step

Find the beam size and maximum ZDC count.

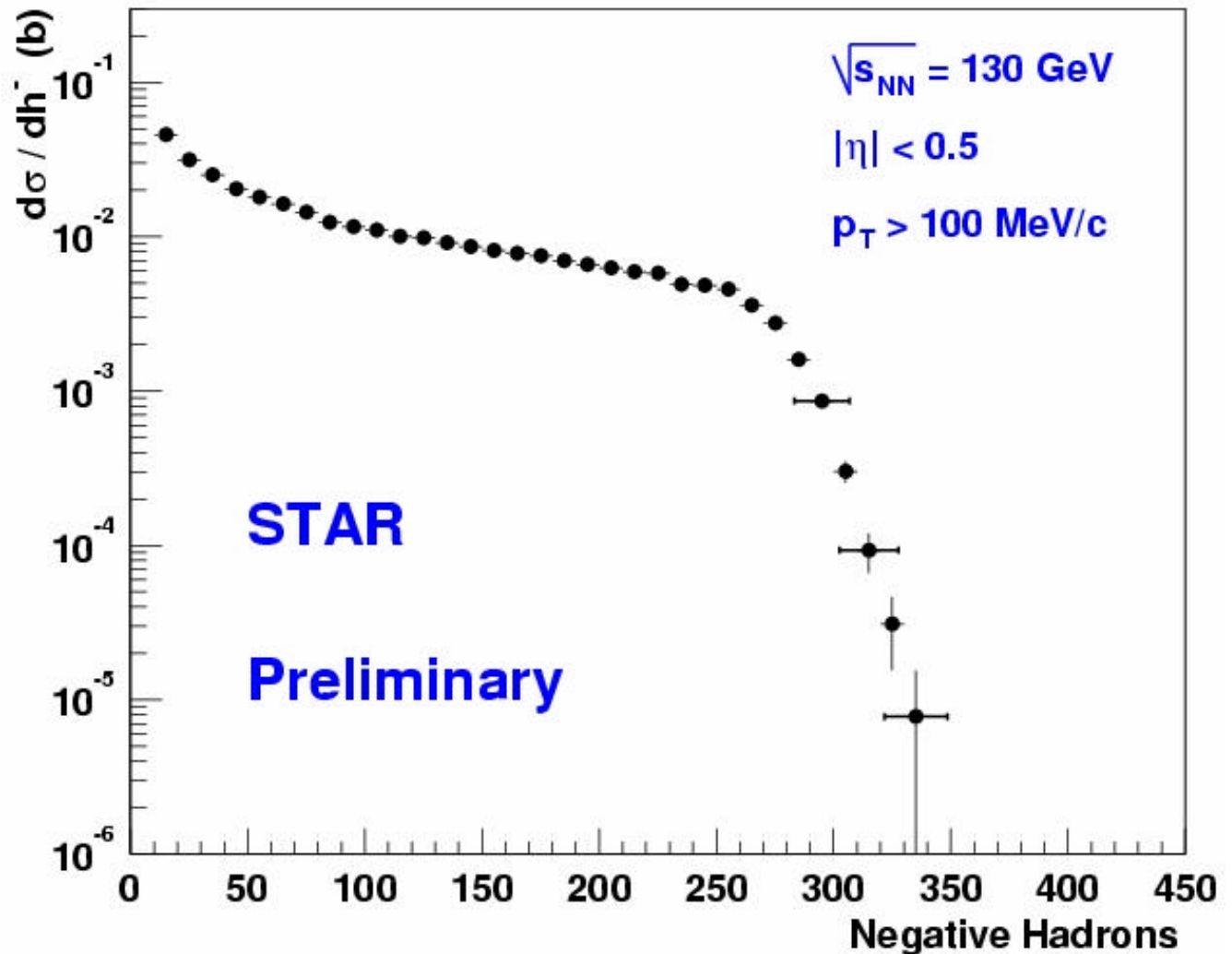
$$L_0 = f \frac{N_1 N_2}{2 p s_{vx} s_{vy}}$$

$$s = N_{ZDC} / L_0$$

Mutual Coulomb dissociation
 \Rightarrow absolute cross section (min bias)

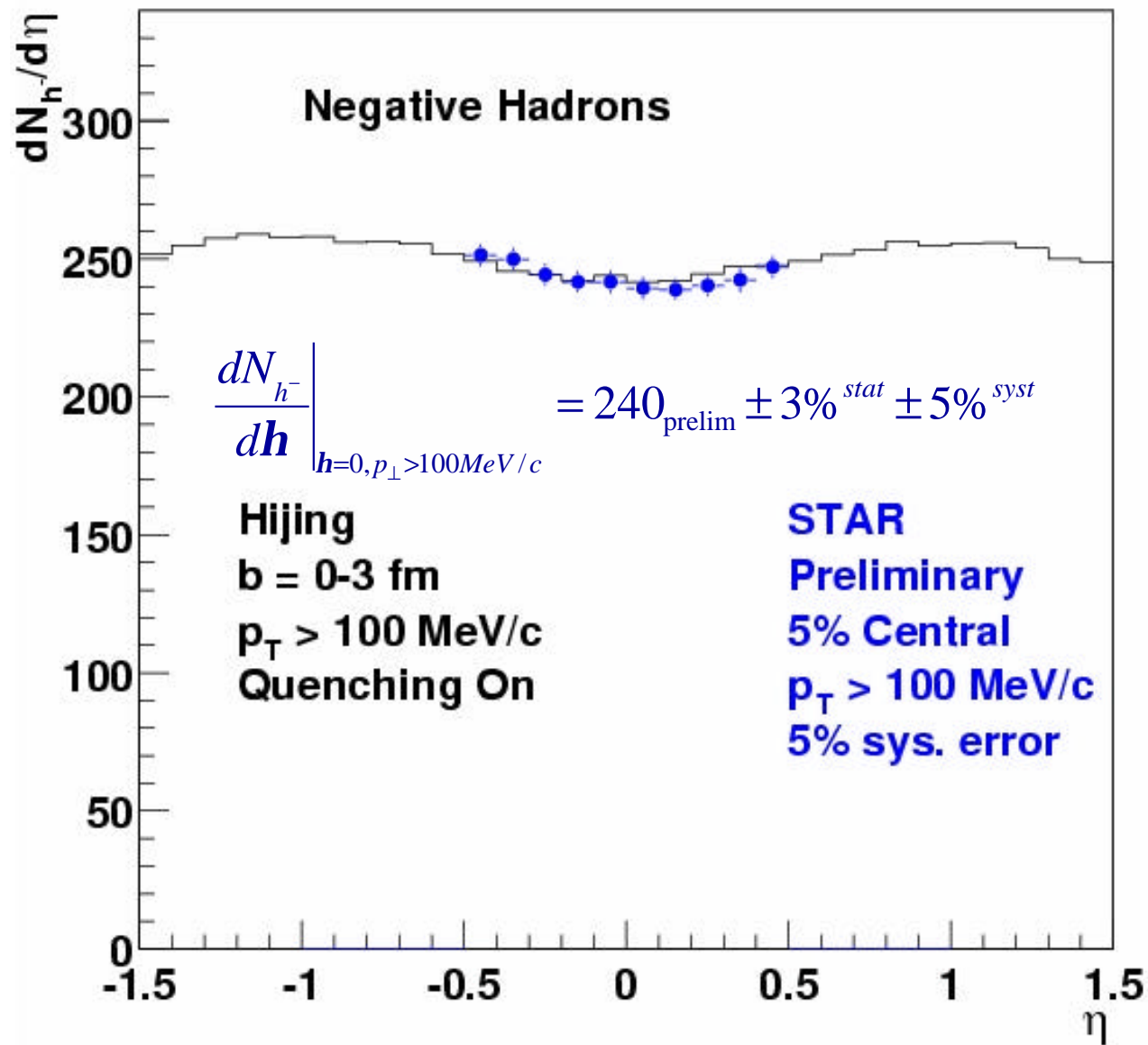
Cross-check:
 beam profile from tracking

5% sys. error shown on 3 points only

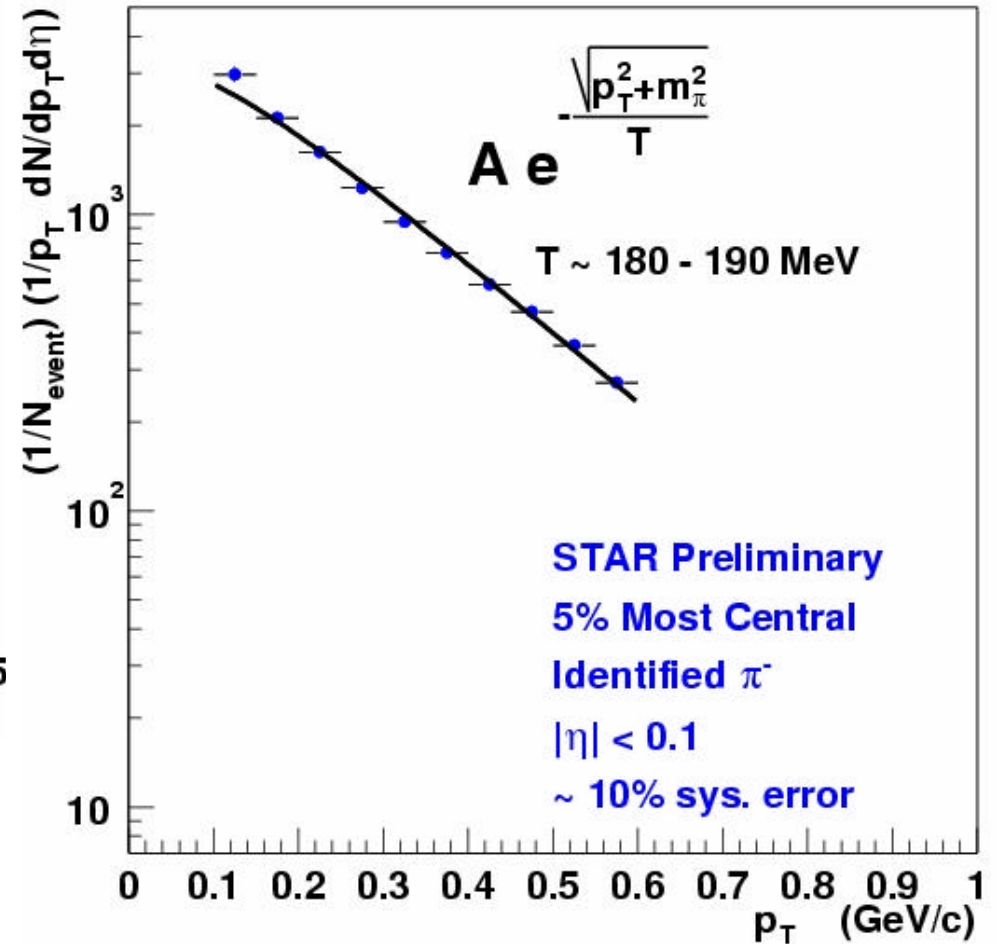
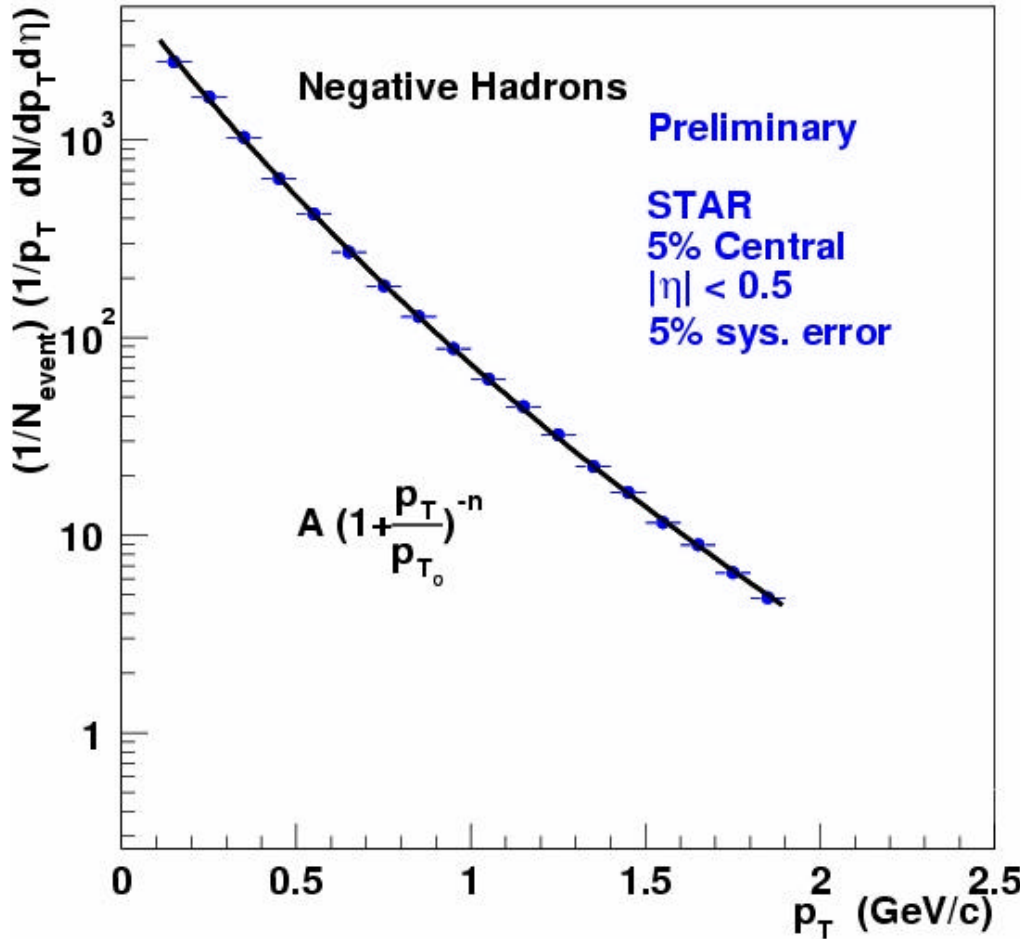


$$\sigma_{\text{Au+Au}} = 8.7 \pm 6\%$$

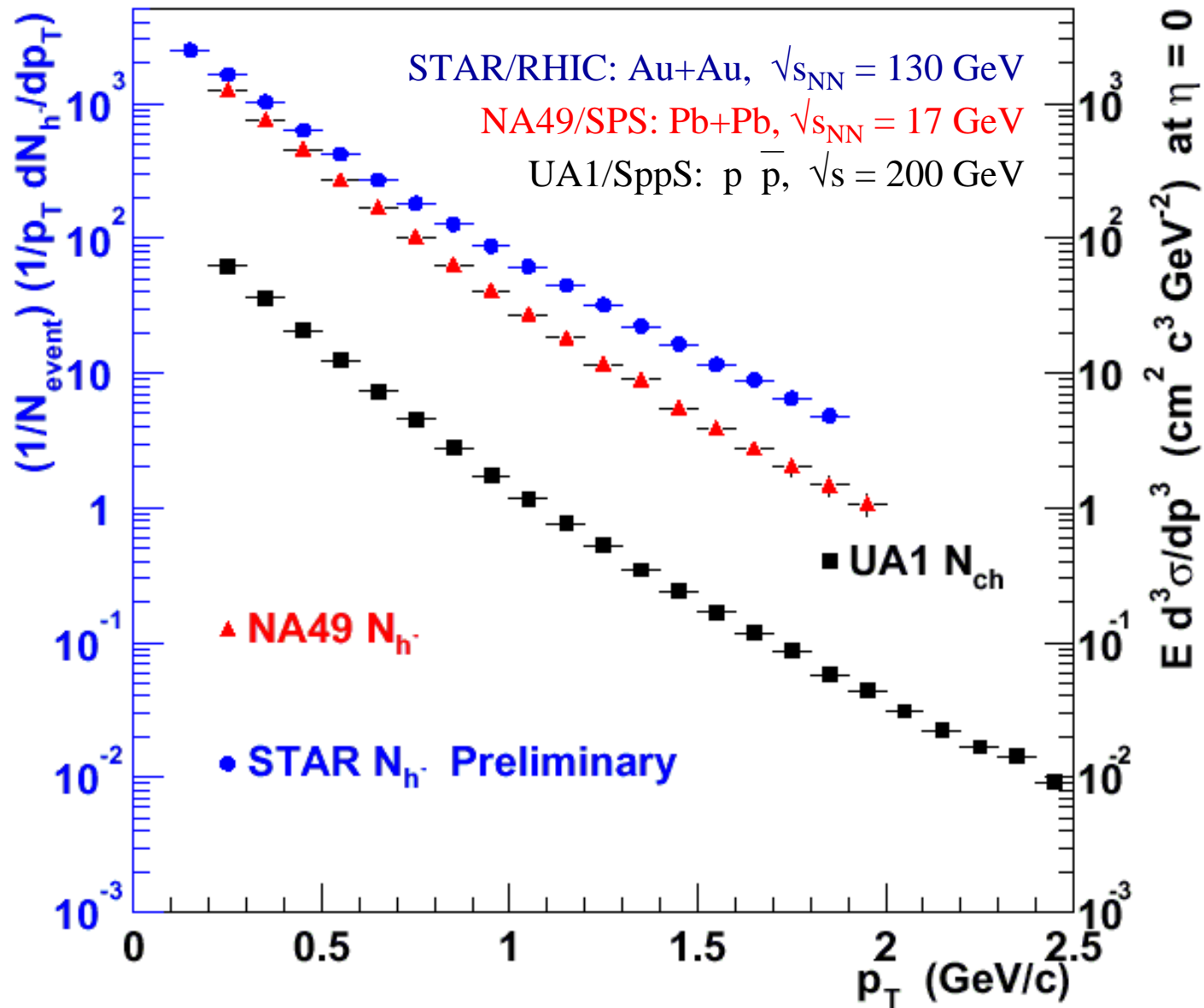
First Results: η Distribution of Negative Hadrons



First Results: h^- and π^- p_t -Distributions



Comparisons of h^- p_t Distributions: STAR, NA49, UA1



First Results: \bar{p}/p at $\sqrt{s_{NN}} = 130$ GeV

Baryons distributions carry information related to

- ◆ stopping and particle production
- ◆ baryon chemical potential
- ◆ thermal equilibrium

\bar{p}/p ratio should be sensitive

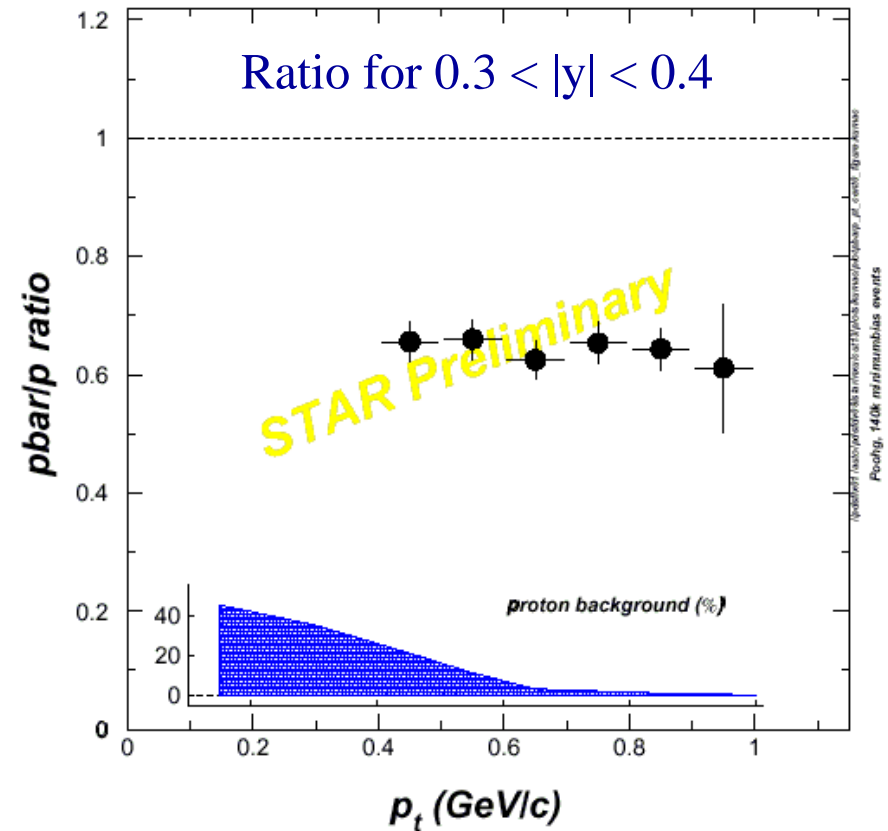
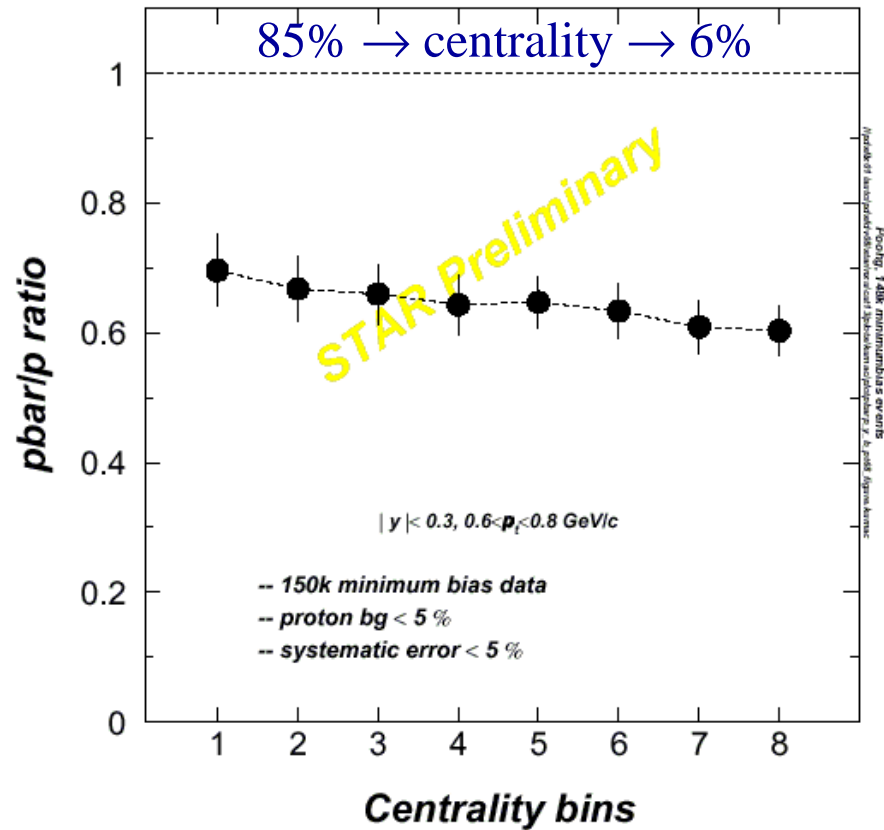
Last call for RHIC predictions (nucl-th/9907090) at $\sqrt{s_{NN}} = 200$ GeV :

- ◆ Quark Coalescence: $\bar{p}/p = 0.6$
- ◆ Fireball: $\bar{p}/p = 0.9 - 1.0$
- ◆ Hijing: $\bar{p}/p = 0.8$
- ◆ RQMD: $\bar{p}/p = 0.5$

STAR preliminary: $\bar{p}/p = 0.65 \pm 0.03$ (stat.) ± 0.06 (sys.)
for $|y| < 0.3$, $0.6 < p_t < 0.8$ GeV/c



\bar{p}/p : centrality and p_t dependence



- No strong p_t dependence
 - Weak centrality dependence
- more stopping and/or other process ?



First Results: $\bar{\Lambda}/\Lambda$ at $\sqrt{s_{NN}} = 130$ GeV

$\bar{\Lambda}/\Lambda$ ratio:

- ◆ net baryon density?
- ◆ Strangeness enhancement?
- ◆ Production mechanism?

Last call for RHIC predictions (nucl-th/9907090) at $\sqrt{s_{NN}} = 200$ GeV

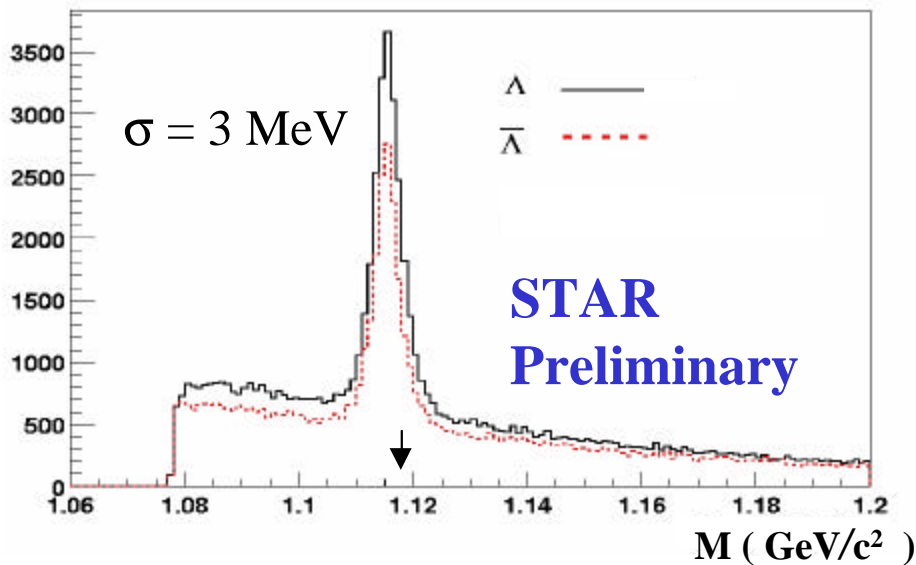
- ◆ Quark Coalescence: $\bar{\Lambda}/\Lambda = D \cdot \bar{p}/p$ where $D = K^+/K^- \approx 1.2$
- ◆ Fireball Model: $\bar{\Lambda}/\Lambda = 0.9 - 1.0$
- ◆ J. Rafelski (chem. non-equil. QGP, sudden freeze-out): $\bar{\Lambda}/\Lambda = 0.5$

STAR

- ◆ Identifying “V0” in TPC
 - $\Lambda \rightarrow p + \pi^-$ (BR = 63.9%, $c\tau = 7.89$ cm)
 - $\bar{\Lambda} \rightarrow \bar{p} + \pi^+$
- ◆ reconstruction $\varepsilon \sim O(5\%)$
- ◆ work in progress, currently studying systematics



$\bar{\Lambda}/\Lambda$ preliminary



Preliminary: $\bar{\Lambda}/\Lambda = 0.70 \pm 0.05$ (stat) ± 0.2 (syst)

