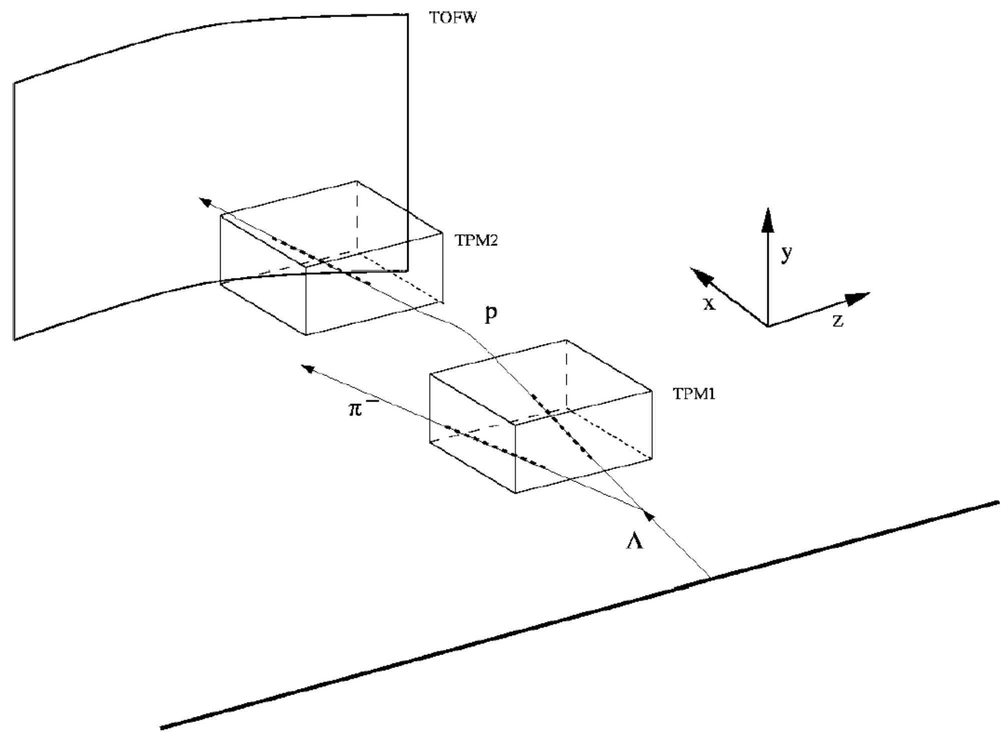
Status of the Λ analysis

- How do we try to get them ...
- Which settings used, statistical problem ...
- Cuts, fit functions, plots and comparisons:

1. Ratios: $\frac{\overline{\Lambda}}{\Lambda}$
2. Λ and $\overline{\Lambda}$ spectra vs m_T and derived temperature

Status of the Λ analysis

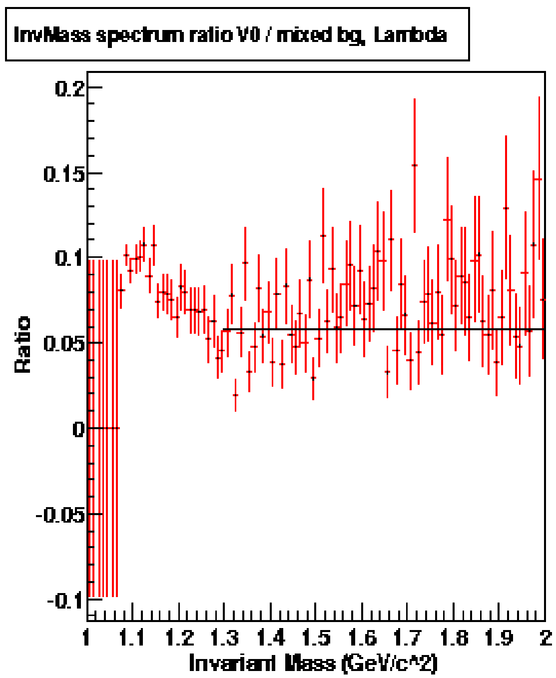
— A V0 candidate

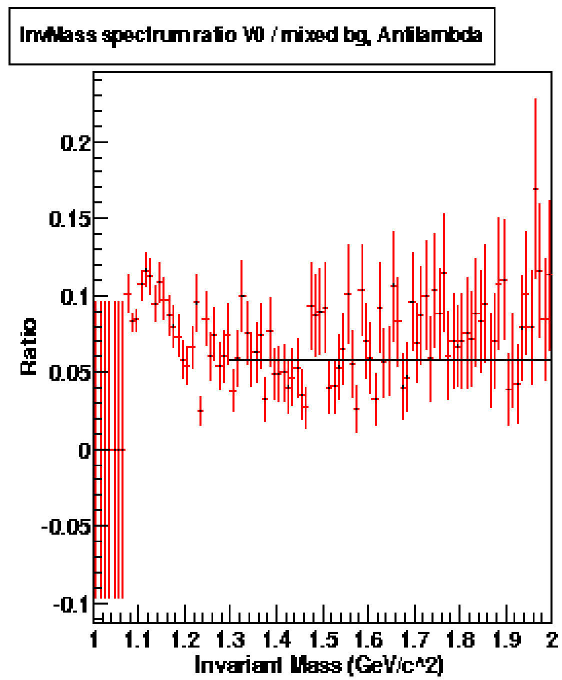


- A $\pi^-(\pi^+)$ in TPM1 and $p(\overline{p})$ in the MRS might make a V0.

Status of the Λ analysis

— Subtracting the background

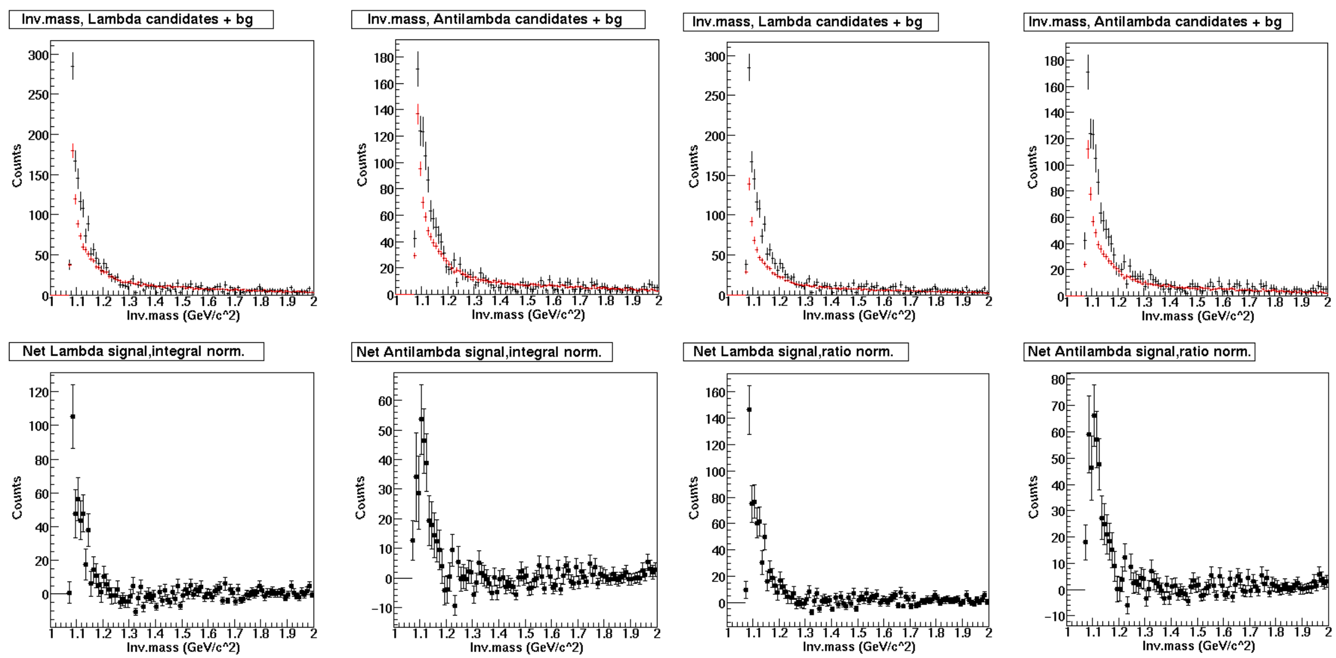




- **Ratio norm.** gives higher yields than **integral norm.**

Status of the Λ analysis

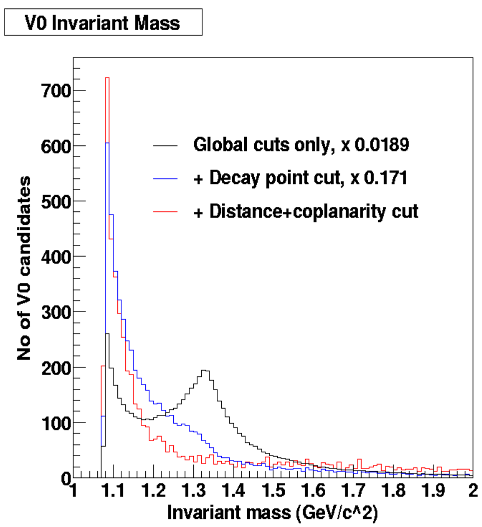
— Invariant Λ mass

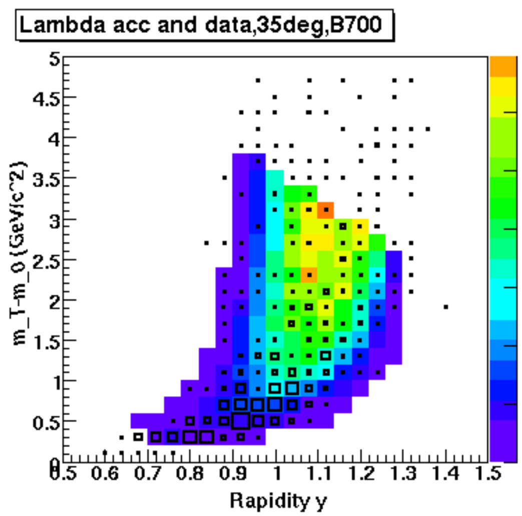


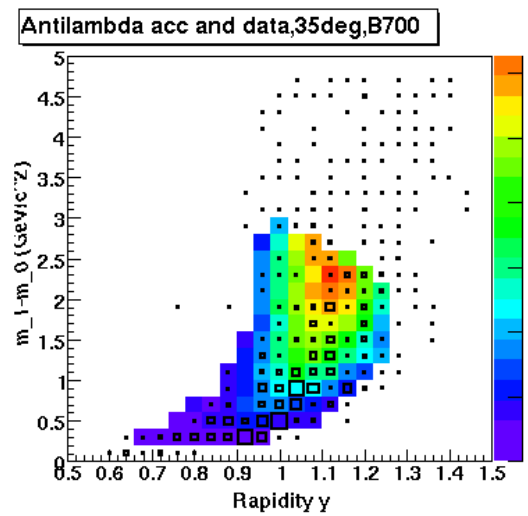
$$m_\Lambda^2 = m_p^2 + m_\pi^2 + 2 \cdot (E_p \cdot E_\pi - \vec{p}_p \cdot \vec{p}_\pi)$$

Status of the Λ analysis

— The raw data



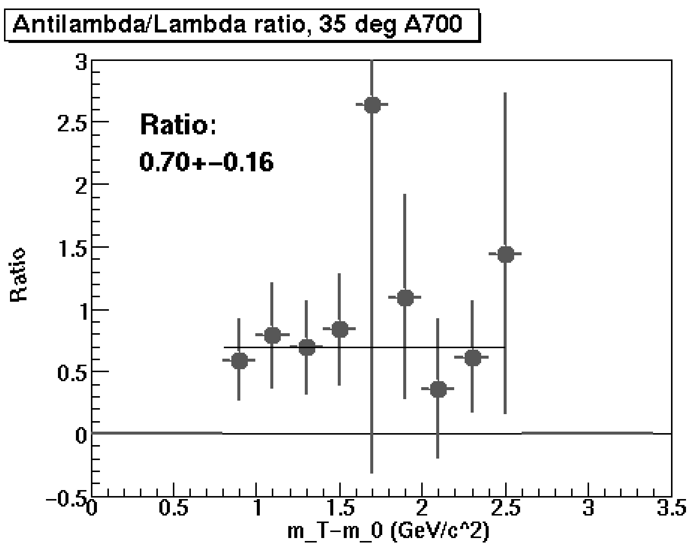


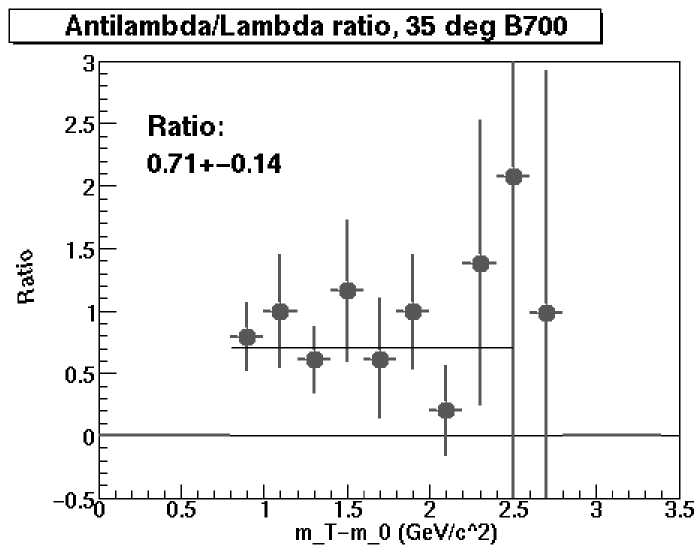


- Applied cuts to get rid of unphysical VO candidates (left figure)
- Raw data compared to the acceptance
- $p_p(\overline{p}_p) \geq 1.0\,\text{GeV/c}$. No upper limit in the $p(\overline{p})$ momentum.

Status of the Λ analysis

— Ratios

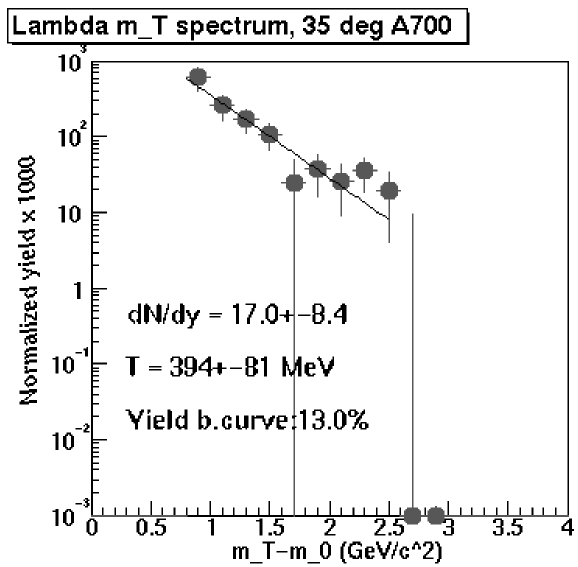


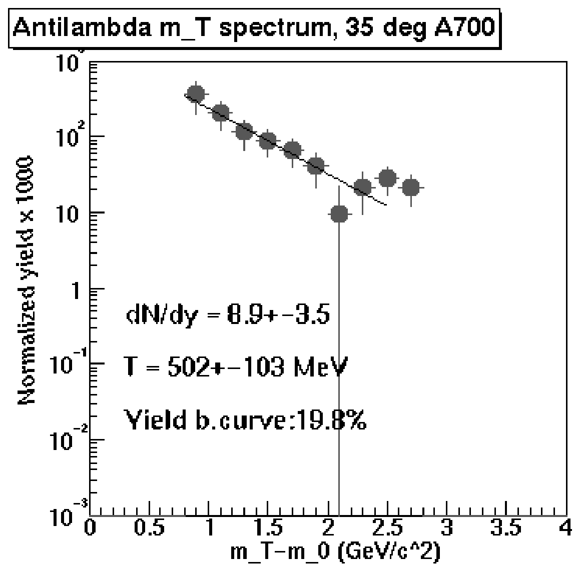


- Acceptance corrected ratios from m_T spectra (efficiencies cancel …)
- Consisten results for A and B polarity, which is m_{T} – independent within uncertainties
- A-fiels ratio : 0.70 ± 0.16
- B-fiels ratio : 0.71 ± 0.14

Status of the Λ analysis

— Λ-field m_{T} spectra



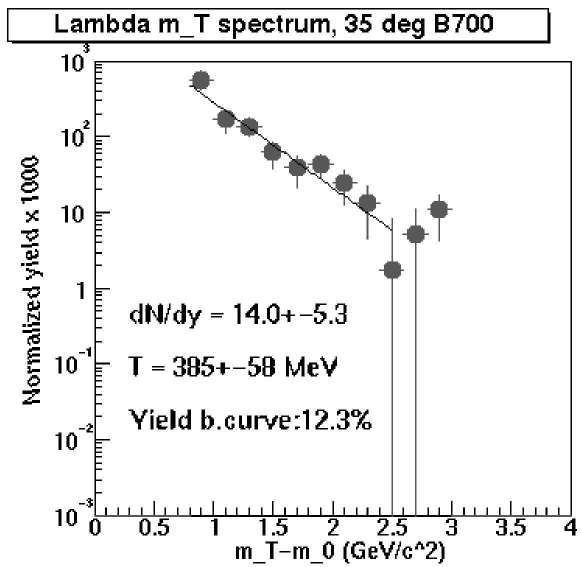


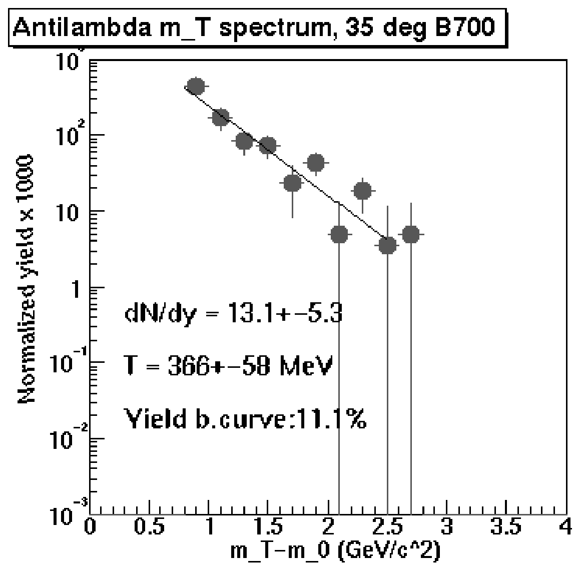
$$\frac{d^2N}{dy dm_{\mathrm{T}}} = \frac{N_{meas}(y, m_{\mathrm{T}}) \cdot C_{acc}(y, m_{\mathrm{T}}) \cdot C_{eff}(y, m_{\mathrm{T}}) \cdot C_{phys}(y, m_{\mathrm{T}})}{N_{events} \cdot \Delta y \cdot \Delta m_{\mathrm{T}}}$$

$(C_{eff}(y, m_{\mathrm{T}}) = C_{phys}(y, m_{\mathrm{T}}) \equiv 1$ in these results ... $)$

Status of the Λ analysis

— B-field m_{T} spectra



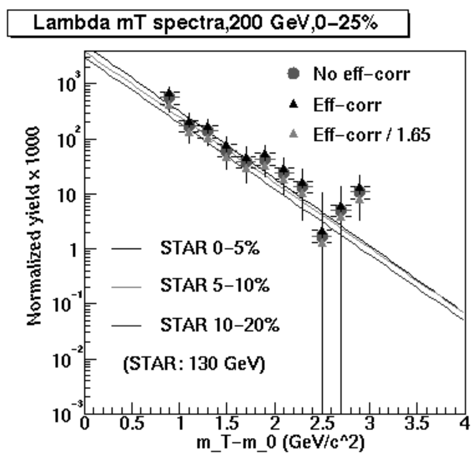


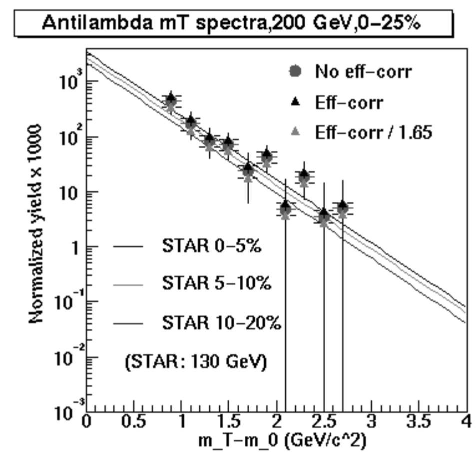
$$\frac{d^2N}{dy\,dm_{\mathrm{T}}} = \frac{N_{meas}(y,m_{\mathrm{T}})\cdot C_{acc}(y,m_{\mathrm{T}})\cdot C_{eff}(y,m_{\mathrm{T}})\cdot C_{phys}(y,m_{\mathrm{T}})}{N_{events}\cdot\Delta y\cdot\Delta m_{\mathrm{T}}}$$

($C_{eff}(y,m_{\mathrm{T}}) = C_{phys}(y,m_{\mathrm{T}}) \equiv 1$ in these results ...)

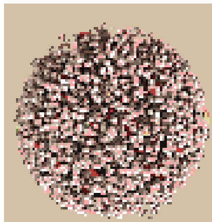
Status of the Λ analysis

— Spectra compared with STAR





- Efficiency factor estimated to 1.25
- STAR data for $|y| < 0.5$ at $\sqrt{s_{NN}} = 130\,\text{GeV}$.
- "Efficiency correction"/1.65 is expected results for **Integral** method
- Is there any STAR data for $\sqrt{s_{NN}} = 200\,\text{GeV}$? none found …



Status of the Λ analysis

— Extracting the yield ($\frac{dN}{dy}$) and inverse slope (T)

$C_{acc} >$	y	$m_{\rm T} - m_0$ [GeV/c^2]	$\frac{dN}{dy}(\Lambda)$	$T(\Lambda)$ [MeV/c^2]	$\frac{dN}{dy}(\overline{\Lambda})$	$T(\overline{\Lambda})$ [MeV/c^2]	Ratio
0.001	0.94 - 1.25	0.8-2.5	14.0 ± 5.3	385 ± 58	13.1 ± 5.3	366 ± 58	0.71 ± 0.14
0.0005	0.94 - 1.25	0.8-2.5	12.7 ± 3.9	396 ± 53	10.6 ± 4.0	387 ± 63	0.70 ± 0.14
0.001	0.98 - 1.25	0.8-2.5	13.2 ± 4.7	401 ± 58	14.7 ± 5.8	365 ± 60	0.76 ± 0.15
0.001	0.94 - 1.21	0.8-2.5	14.0 ± 5.4	386 ± 60	14.4 ± 6.0	350 ± 55	0.80 ± 0.16
0.001	0.94 - 1.25	1.0-2.5	9.8 ± 4.0	438 ± 75	8.5 ± 3.9	426 ± 82	0.68 ± 0.14
0.001	0.94 - 1.25	0.8-2.3	13.5 ± 6.0	395 ± 74	15.4 ± 6.7	341 ± 56	0.70 ± 0.14

Table 1: Sensitivity of dN/dy and T in fit related parameters. $p_p \geq 1.0\,\mathrm{GeV/c}$. No efficiency corrections ...

$$\frac{1}{2\pi m_{\rm T}}\frac{dN}{dm_{\rm T}}(m_{\rm T} - m_0) = \frac{dN/dy}{2\pi \cdot (m_0 + T) \cdot T} e^{\frac{-(m_{\rm T} - m_0)}{T}}$$