

Light Vector mesons from dAu in PHENIX

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Scope of talk at QM (I hope)

Phi to ee (dAu)

This set of slides

Phi to kk (dAu)

Dipali (poster)

Phi to KK (AuAu)

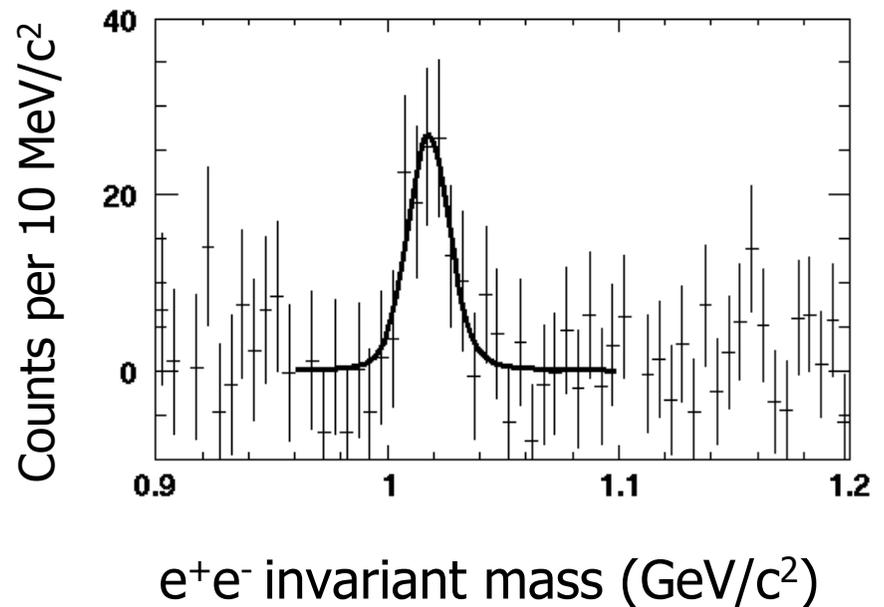
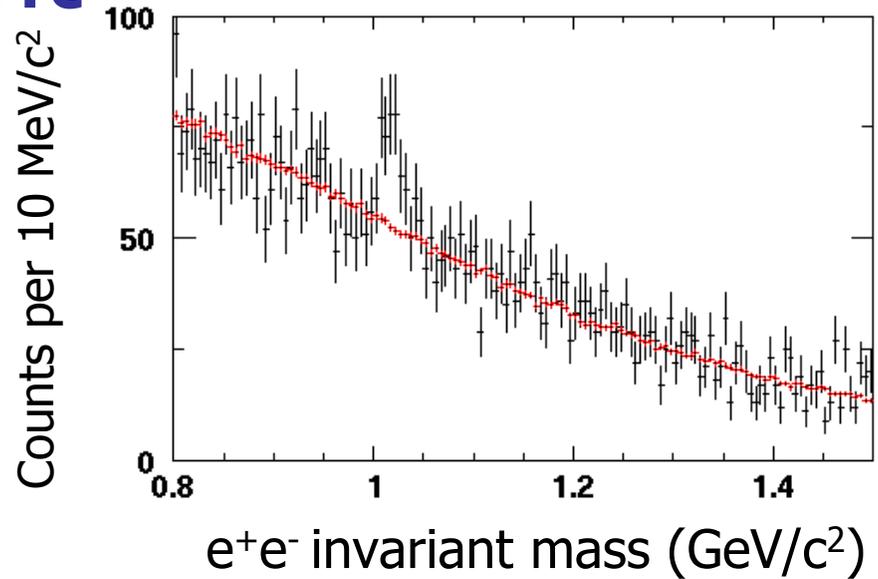
Charlie (poster –final – on to publicaton)

Plots and numbers

- Request for preliminary on
 - dN/dm_T for minimum bias phi to ee
 - dN/dy and T (numbers)
- Other plots
 - Invariant mass spectra
 - Mass consistent with PDG
 - Γ fixed to PDG value
 - Experimental mass resolution – free parameter
 - Comparison dN/dm_T with dAu phi to KK (dipali)
 - Comparison with dAu phi to KK and AuA
 - Slopes
 - Yield per participant
 - $\sqrt{\text{Yield per participant}}$ comparison plot, add kaons?

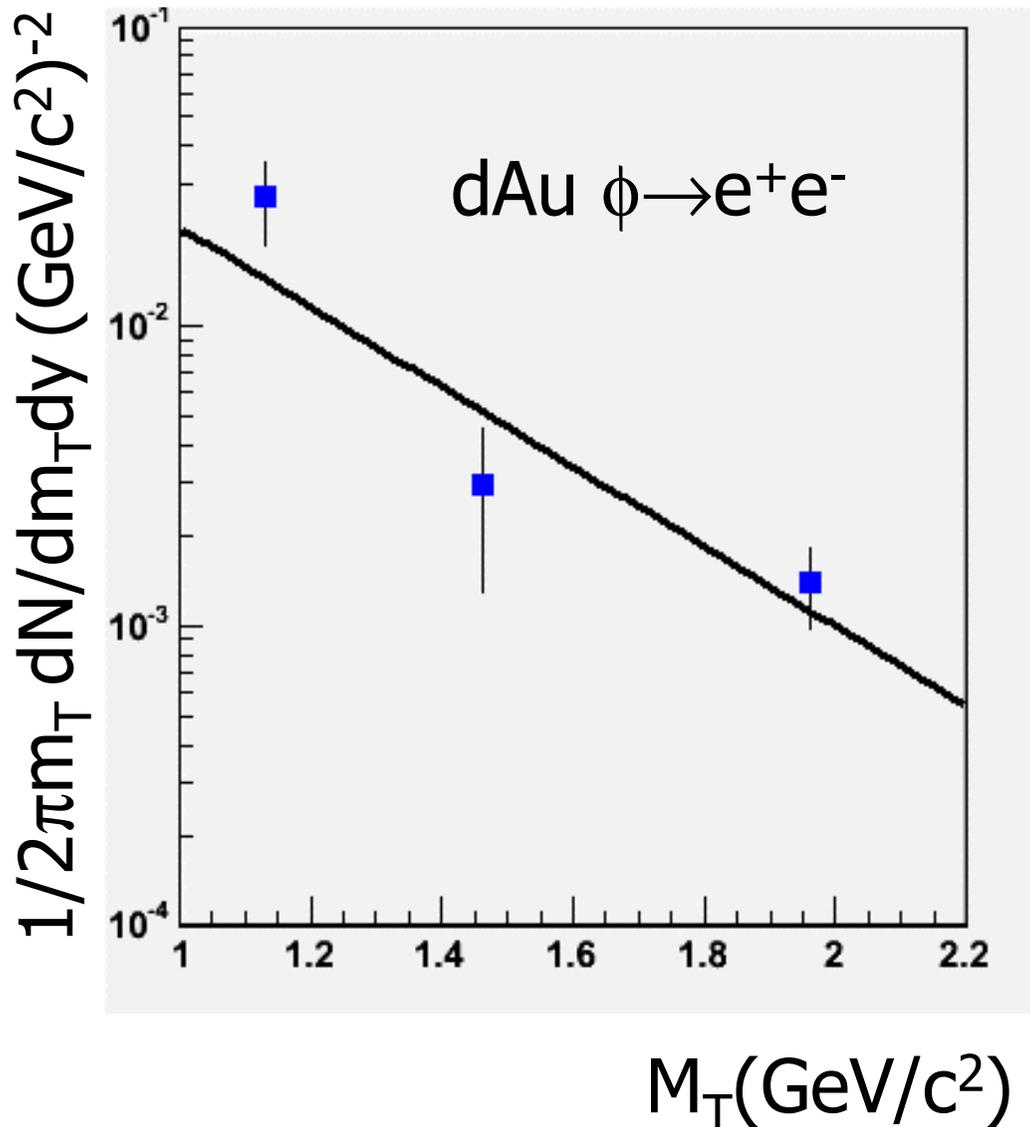
Min bias, all mt

- $M=1.0177 \pm 0.0023$ GeV
- $\Gamma=0.00446$ (fixed) GeV
- $\sigma_{\text{exp}}=0.0081 \pm 0.0021$
- $\chi^2/\text{DOF}=13.6/13$
- Fit is to relativistic B-W convoluted with gaussian



Supporting plot

dN/dmt and yield



$$\frac{dN}{dy} = .056 \pm .015 (\text{stat})$$

$$\pm 50\% (\text{syst})$$

$$T = 326 \pm 94 (\text{stat}) \pm 53\% (\text{syst}) \text{ MeV}$$

- The major contributions to the systematic error are
 - normalization of the background and signal extraction and the way the variations affect T and hence dNdy
 - The run-by run variation from the ERT

Needs preliminary

Comparison with KK results

- The blue points are the ee points. This is compared to dipali's dAu as of Jan 6

ee channel

$$dN/dy = .056 \pm .015(\text{stat}) \pm 50\%(\text{syst})$$

$$T = 326 \pm 94(\text{stat}) \pm 53\%(\text{syst}) \text{ MeV}$$

KK channel

$$dN/dy = 0.0423 \pm 0.0063(\text{stat}) (+0.0076, -0.0073) (\text{syst.})$$

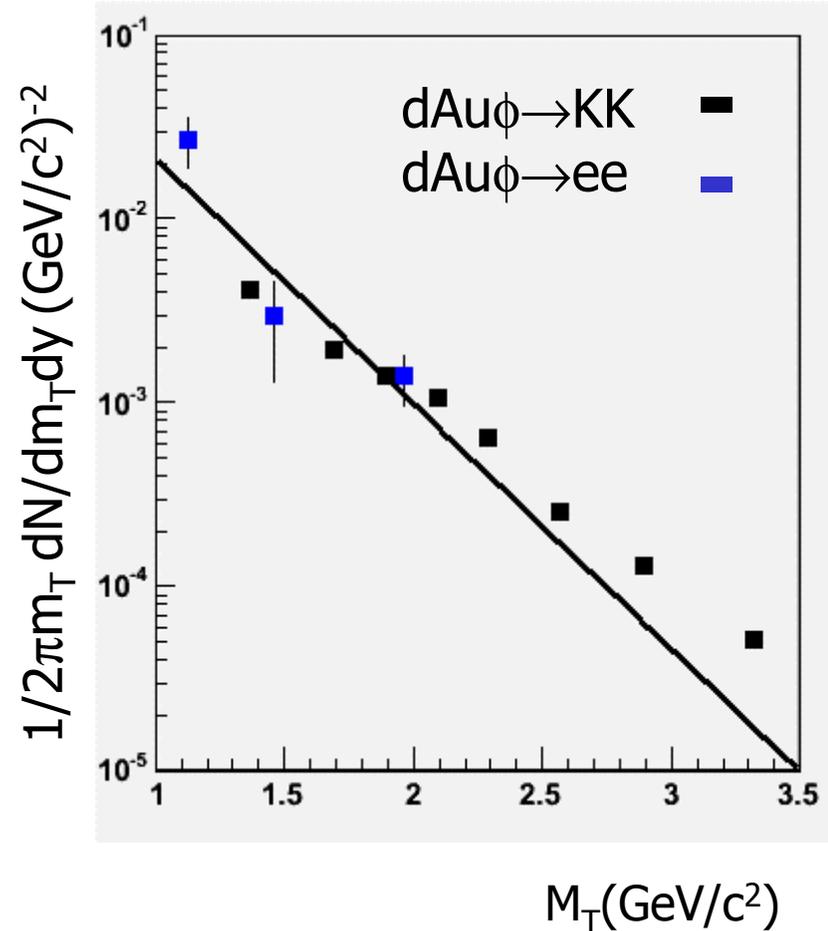
$$T (\text{MeV}) = 429 \pm 27 (\text{stat}) \pm 35 (\text{syst})$$

Should I kill the fit line?

dipali's latest

Need to get official

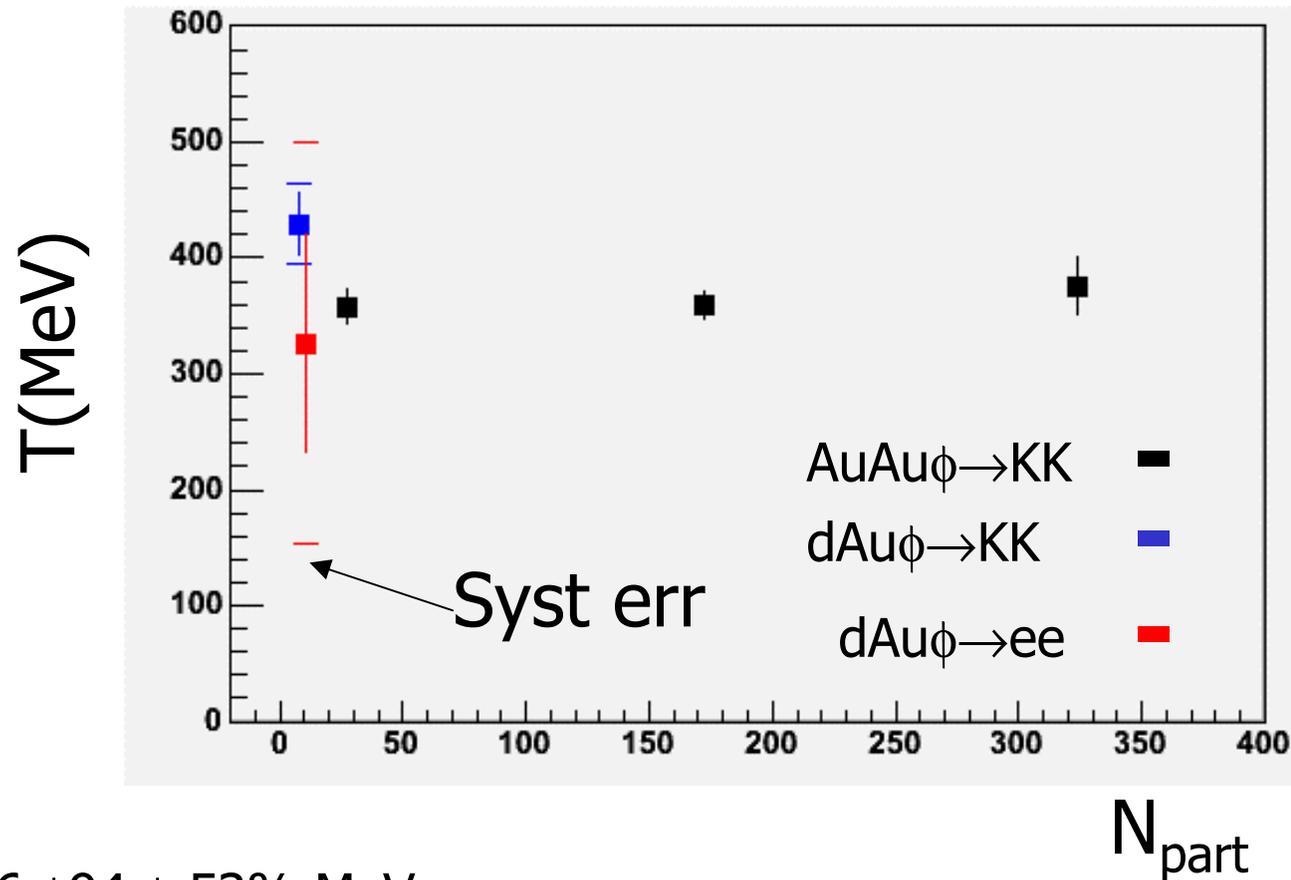
Points w/errors from her



derived plot

Comparison with Au + Au results and dAu for reference

- The inverse slope from this analysis is in line with the Au-Au data which is at about $T \sim 350$ MeV and is consistent with the dAu data at about 440 MeV



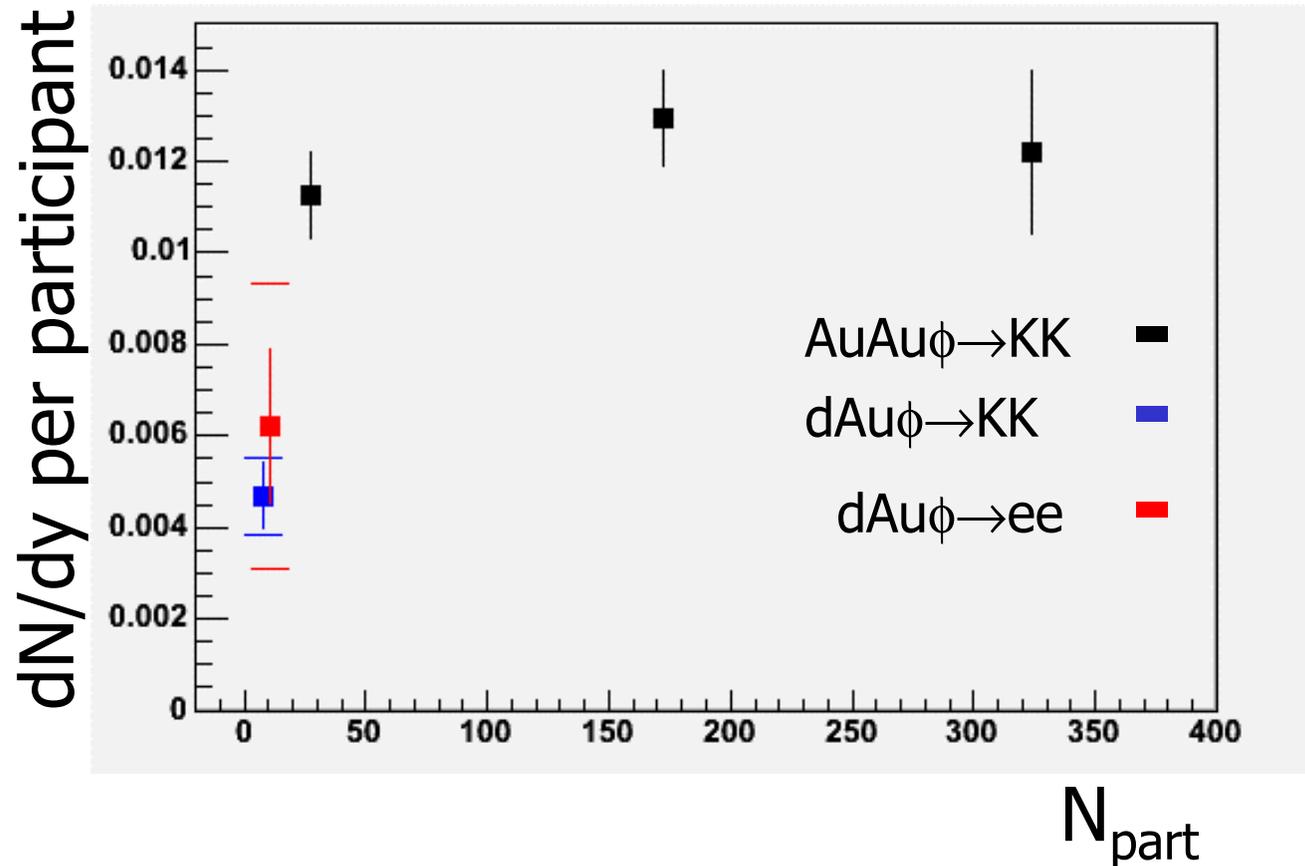
$$T = 326 \pm 94 \pm 53\% \text{ MeV}$$

Dipali's new points
Must update Au-Au points
to latest with systematics

derived plot

dN/dy per npart (npart~9)

Dipali's new points
Must update Au-Au points
to latest with systematics



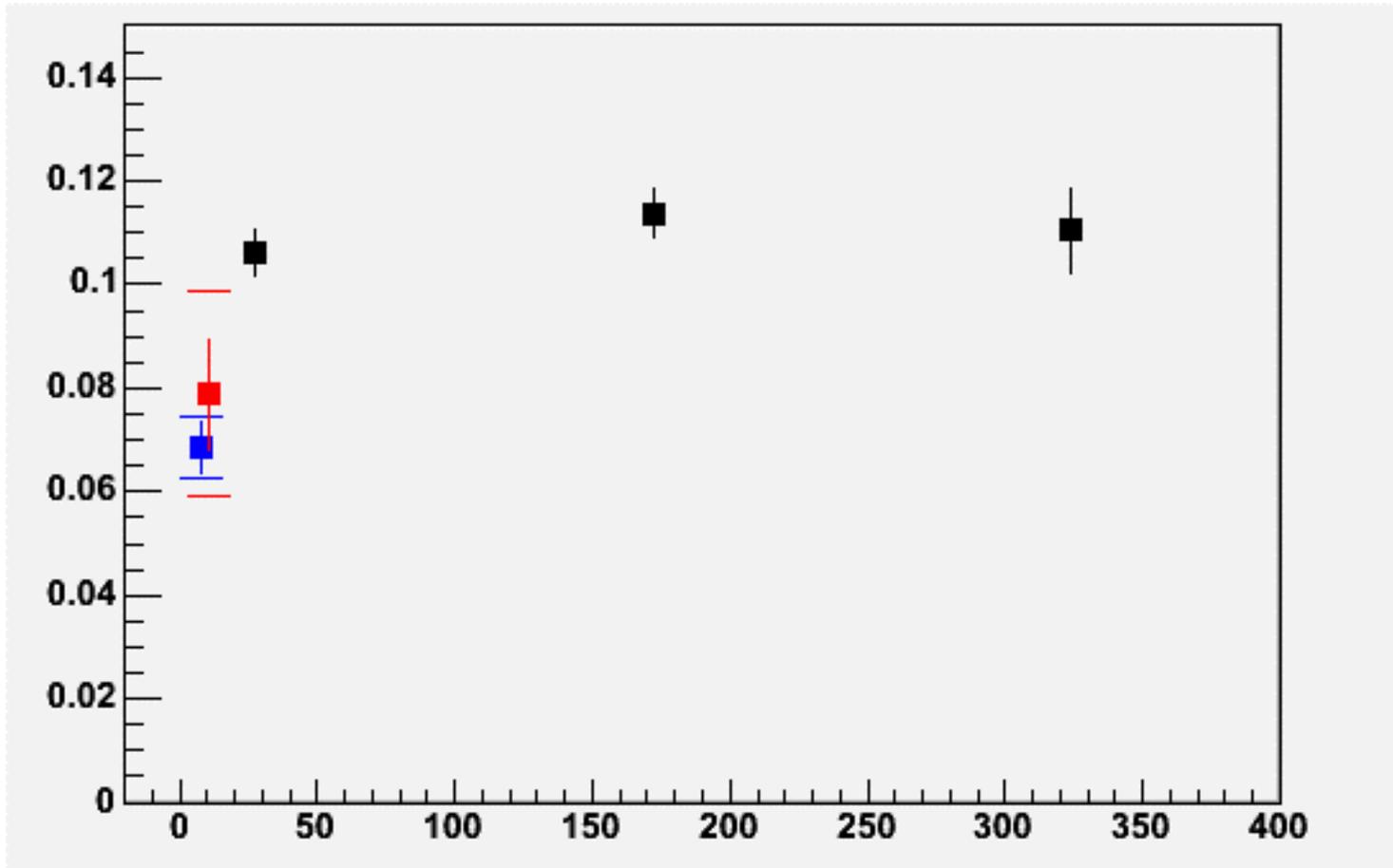
$$dN/dy = .056 \pm .015(\text{stat}) \pm 50\%(\text{syst})$$

derived plot

Sqrt(n)

Dipali's new points
Must update Au-Au points
to latest with systematics
Put kaons on here?

Sqrt(dN/dy per participant)



derived plot

N_{part}

Conclude

$$dN/dy = .056 \pm .015(\text{stat}) \pm 50\%(\text{syst})$$

$$T = 326 \pm 94(\text{stat}) \pm 53\%(\text{syst}) \text{ MeV}$$

- Physics comments:
 - A first measurement has been made of the phi to ee channel. Within error bars it agrees with the KK result.
 - Factor ~ 2 enhancement from dAu to AuAu
 - More?
- A proposal
 - One of the phi folks (yuji, charlie, dipali, indrani, ~~rich~~) should gather all the data points and make nice combined plots of dAu(KK,ee), AuAu
 - We will all need them

Systematic errors

- Several sources of systematic errors are considered. These we believe are the largest.
 - Changes in the acceptance because of the input spectrum given to the MC. I note that on face value the fit of $T=326$ MeV is self-consistent with the input value of $T=320$ MeV. We vary the input spectrum to see the effect
 - Changes in the number of phi's counted. As mentioned, I will examine the effect of changing the background normalization scheme and the mass window chosen for integration. This will of course give a systematic error to T which will in turn propagate to dN/dy
 - ERT efficiency. The systematic of the ERT trigger efficiency is obtained in a standard way used by the ERT group. The noise and thresholds are varied to obtain a upper and lower value for the ERT efficiency as shown previously. Note that the phi is very sensitive to the turn on of the ERT trigger.

Summary of systematic errors

	Effect on dndy	Effect on T
Slope assumption effect on acceptance	1%	1%
Slope assumption effect on ert eff	2%	2%
Background subtraction and counting	45%	50%
ERT fluctuations	20%	16%
Run-by-run	5%	-
Total	50%	53%