

Neutrals Corrections for 18 series



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Questionnaires to AWGs

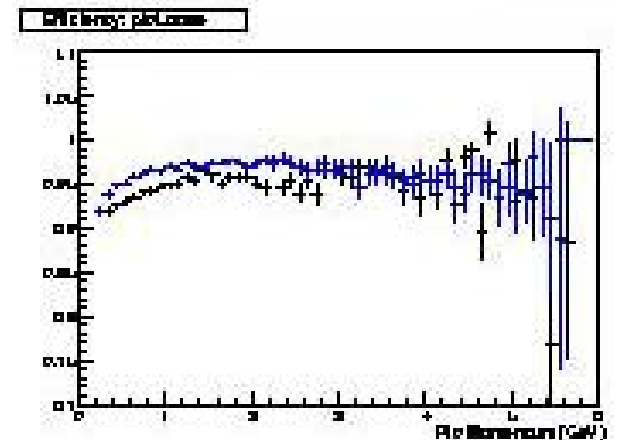
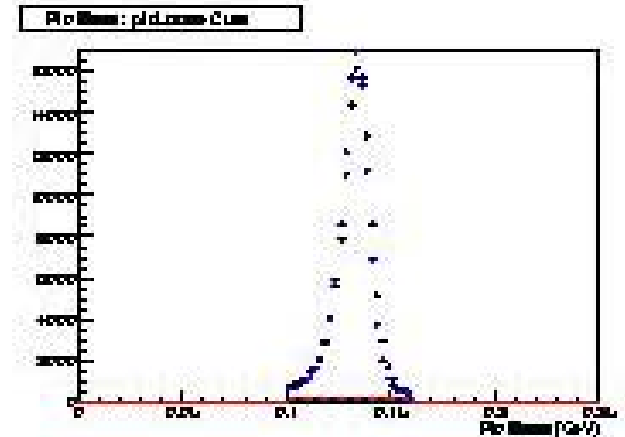
- We sent out a list of questions to AWGs, including:
 - Can you successfully use the neutrals corrections?
 - How good do you need the π^0 efficiency systematic?
 - Is the energy smearing we currently use appropriate for you?
- Thanks to those who responded

Pi0 efficiency

- Current method of efficiency estimation uses double ratio:

$$\frac{(T \rightarrow \rho)_{DATA} / (T \rightarrow \rho)_{MC}}{(T \rightarrow \pi)_{DATA} / (T \rightarrow \pi)_{MC}}$$

- Has been in use for > 1 year
 - Proven method, works well
 - Needs full repeat for 18 series
 - Good to 3% systematic

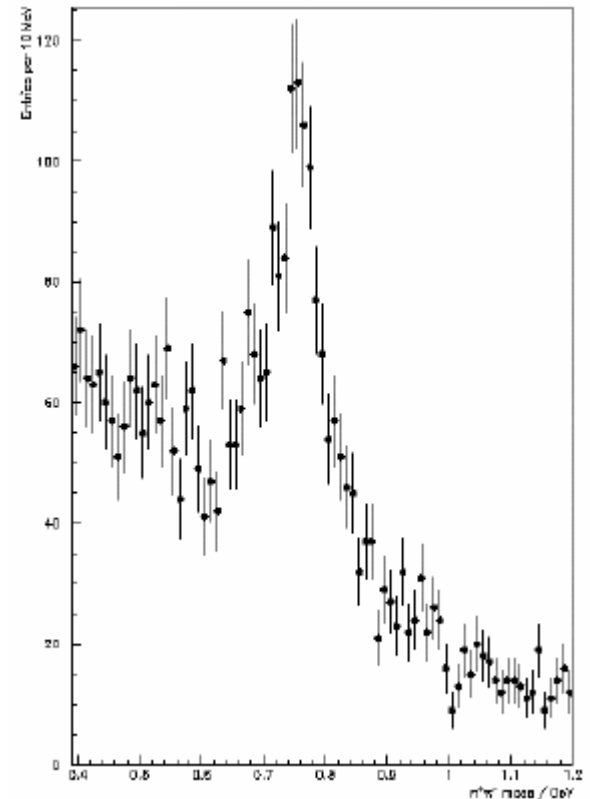


Pi0 efficiency – <3% systematic

- A year ago, 3% was good (champagne winning)
- 3% is now unnacceptably high for some analysis
- Immediate plan: most systematic uncertainty can be attributed to low energy photons:
 - Recommend $E_\gamma > 100$ MeV cut, which will drop systematic to $\sim 2\%$
 - Lower energy photons can be used if higher systematic is accepted
 - Meanwhile, we will continue to push down systematic as far as possible

Pi0 efficiency cont.

- Also looking at alternative methods of studying efficiency:
 - ISR $e^+e^- \rightarrow \pi^+\pi^-\pi^0\gamma$
 - $D^0 \rightarrow K^+\pi^-/K^+\pi^-\pi^0$
- Additionally – with the systematic dropping, we will need to re-evaluate the effect of a high multiplicity environment (currently relying on a really old study)

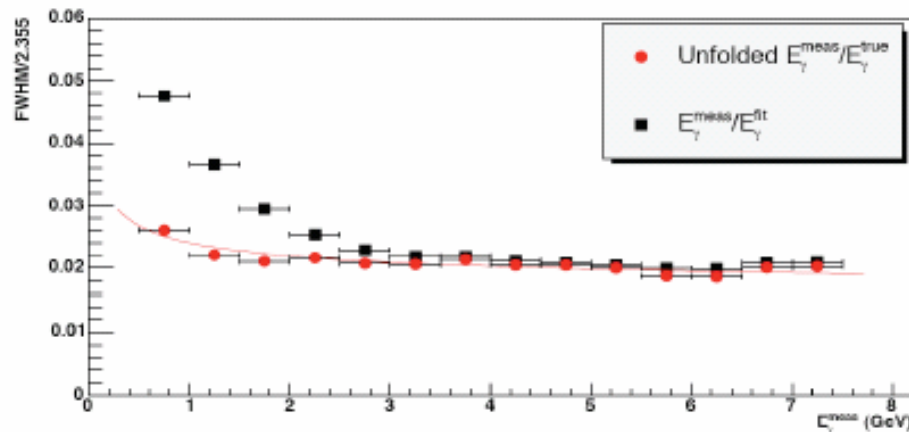


ISR $e^+e^- \rightarrow \pi^+\pi^-\pi^0\gamma$

Energy scale and resolution

- We will provide corrections for both new and old calibrations
- Currently we rely on measurement from π^0 with checks for consistency from other sources
- **Want to move to full integration of information from π^0 , η , and $e^+e^- \rightarrow \mu^+\mu^-\gamma$**

Resolution
measured
with $\mu^+\mu^-\gamma$



Energy Scale and Resolution

- Currently correction is applied as a shift + a (gaussian) smear to the energy value of MC photons
- Gaussian smearing is not really a good analogue for the difference between data and MC (especially at high energy)
- **We will move to a more complex smearing scheme to provide a more effective correction (making use of existing basic smearing mechanism)**

Summary

- Many improvements planned
- We think we have priorities right for what to put effort into
- Let us know if you need something not shown here
- Plenty of work to do – if you rely on this work, the time to volunteer is now