In preparing Geant 4 thetaC resolution vs. path plots for Jerry's talk I noticed that the pixel resolution I find for slot 3 in real data is typically 8-9 mrad instead of 6-7 mrad which Jose and Jerry find.



I was using 5 mrad bins, standard ROOT double-Gauss fit (ER0 options, second Gauss mean and width fixed to 822/40)

Example: pos 1, run 22, direct photons  $\rightarrow$  9.2 mrad

my fits look as OK to me as Jose's and Jerry's



## ROOT has another fit option: log likelihood (ELR0)

Example: pos 1, run 22, direct photons  $\rightarrow$  8.5 mrad



## The two method produce significantly different results

chi squared

## log likelihood



I verified that chi squared fit properly ignores bins with zero content and zero error.

Plot fit result for various bin sizes:





G4 - chi squared fit

## Entres 394259 622.577 Entries Mean RMS Underflow Mean RMS Underflow 6.72636 1000 ..... Overflow Integral x<sup>2</sup> / ndf p0 Overflow 394269 2.663e+05/15 3.769e+05±22629 4000 inco X<sup>2</sup>/ndf 619±0.0 0.1162±0.0015 R1 멇 vor 3000 2905±52 6 700 700 1000 100 Entries Mean RMS Underflow Entrie Mean 394259 622*5*77 2000 RMS Underflow Overflow Integral X<sup>2</sup> / ndf P0 6.72636 200 Diversion Overflow Integral x<sup>2</sup> / ndf p0 p1 p2 700 700 394259 7.965e+04 / 13 4.106e+04 ± 63 622.5 ± 0.0 6.266 ± 0.013 6000 6000 12 3000 - log likkelihhod fit 3000 2502 ± 12.7 4000 4000 3000 300 2000 2000 1000 1000 heri Entries Entries Mean MMS Underfic 391250 ns Tat 622.577 Mean 8.72638 RMS Underflow Cventow Integral x<sup>3</sup> ( ndf p0 Overflow Integral y<sup>2</sup> / ndf p0 p1 p2 100È 394232 0.0130+04711 7.04+04 ± 135 822.4 ± 0.0 9.041± 0.01 1.002a-02 + 1.31 (a-0) 94 394259 622.577 Entrie Entries 160.0 Mean RMS Underflow Mean RMS Underflow 6.72636 140 Overflow Overflow Integral y<sup>2</sup> / ndf p0 p1 p2 394289 130 384289 9:69e+04/6 1.072e+05±214 6219±0.0 6.743±0.015 10 / ndf 100 201.6 ± 43.2 ۰E h m 394250 622.577 Entries Mean hotres 160 Entries Mean RMS Underflow n MES 6.72636 Indenfic 1+0 F Cranflow Integral X<sup>3</sup> (ndf Overflow 394252 170 p1 p2 p2 p2 p1 p2 41 24 / 3 1.37 1=+05 ± 305 622.0±0.0 9.375±0.011 100 0.001313 ± 11.720229 **n**3

• E





Not sure what to do – average and FWHM of binning method? What do you think?