Calibration Results

1 hour run taken at 17:00 Fri 7/16

Fit Performance (Offline)
Initial parameter estimation
$\chi^2$ minimization over peak region (4.6-6.6 MeV)
Requires validation

BaBar EMC Source Calibration
Fit Validation Criteria

Goodness of fit
Resolution estimate vs peak region size (2MeV)
Peak height estimate
Parameter Fit Results

Gain (x256 ADC cts/MeV)

Energy Resolution (MeV)

σ_{Gain}/Gain

σ_{Reso}/Reso

BaBar EMC Source Calibration
Fit Precision

Peak determination governed by statistics and energy resolution
Flow to each barrel quadrant and each endcap half is adjustable.
Current Precision Performance Factors

\[ \frac{\sigma_{Gain}}{Gain} \propto \frac{1}{\sqrt{\text{NumPeakEvents}}} \]

Generator - OK

DAQ Livetime

Ran with low thresholds (mostly) - 2.4% eff
High thresholds -> 7.5%
   Requires raw noise reduction

Filter window : sample window
   37 : 128 -> 71%
   37 : 512 -> 93%
   Requires testing + dataflow development

UPC DMA suppression (sparsification)
   Need high thresholds to take advantage
   7.5% -> 25%
   Requires dataflow development
Daily Running Scenario

Sub-Percent Precision
  Reproduceability not yet proven
  Cannot calibrate all crystals at present
    Requires noise reduction (filtered)

Hardware - OK
  Generator lifetime ~ 100s of hours

Safety Implications ~ OK
  Provided that most running is during
    “No Access”

Need to renegotiate with Rad Safety Committee and draft new Beam Authorization

Operator Availability ~ OK
  Only 4 designated trained operators as agreed
    with Rad Safety Committee
Plans

Fix threshold and digital filter problems
Run again and reproduce
Improve validation procedure

Write to DB

Uncomment automated fits, validation, and db archiving

Activate/orient all four operators