The background of the slide is a photograph of the ATLAS Forward Calorimeter. It shows a complex, circular structure with many radial and concentric metal beams, creating a grid-like pattern. The structure is illuminated from the side, creating strong shadows and highlights. The overall color palette is a mix of metallic greys and bright whites.

ATLAS Liquid Argon Forward Calorimeter Status of Calibration Test Beam Analysis

J. Rutherford
11 September 2002

Goals of Test Beam Run

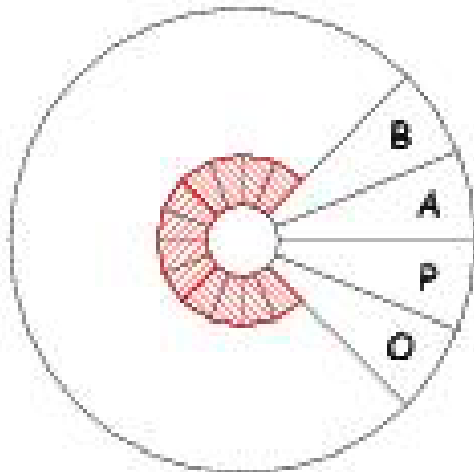
- ◆ Energy calibration of the FCal
- ◆ Edge scan at high $|\eta|$
- ◆ Repeat HV cold test of last November

Instrumented Sections

Limited due to availability of pigtails

7 pigtails

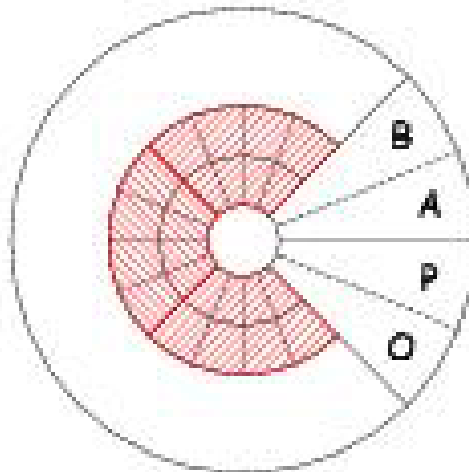
4 regular SBs
3 special SBs



FCAL1C

5 pigtails

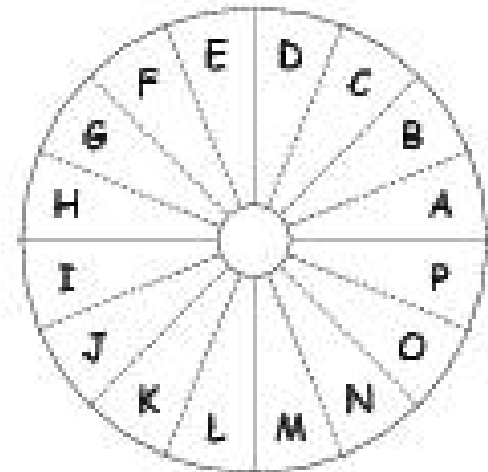
2 regular SBs
3 special SBs



FCAL2C

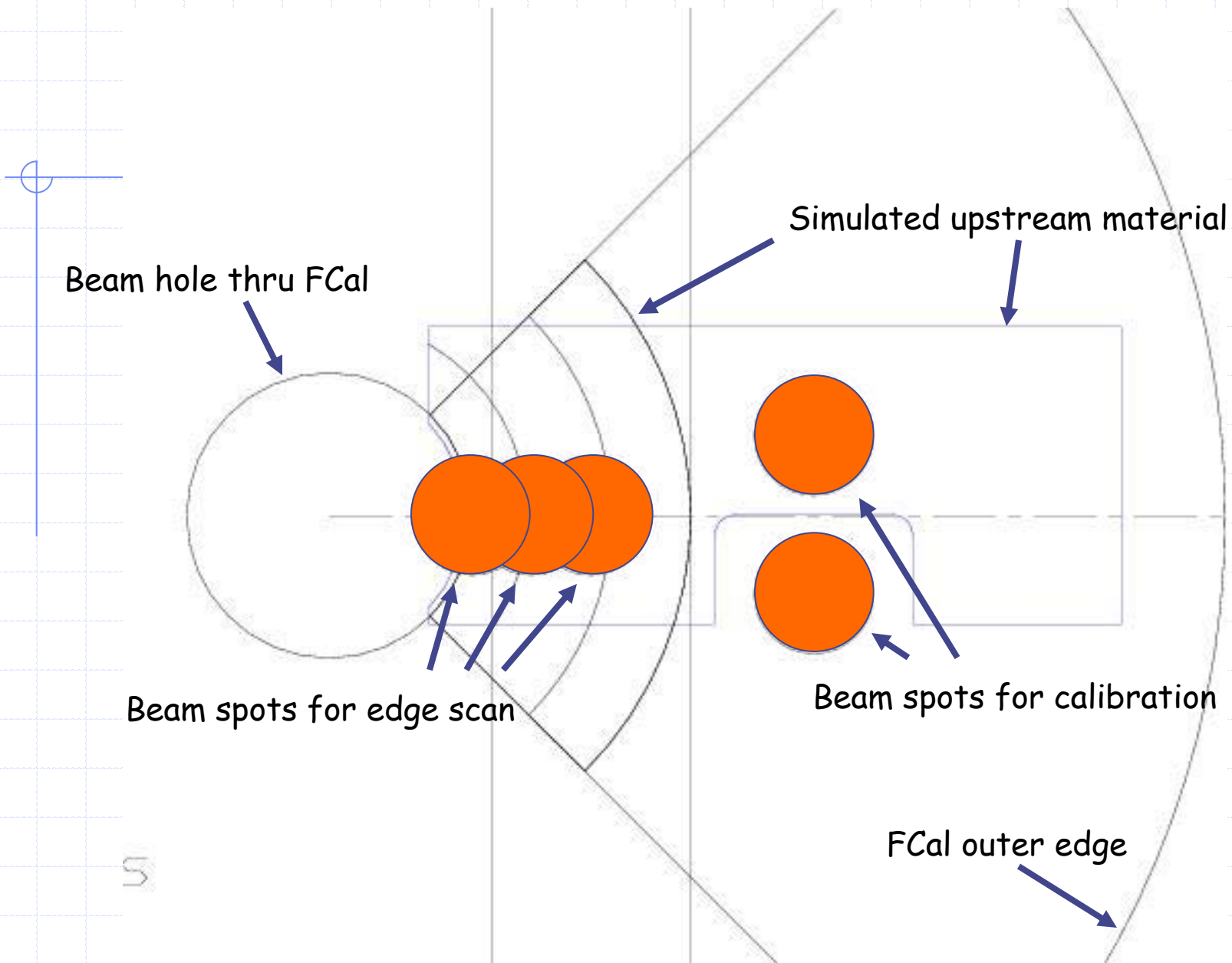
4 pigtails

4 regular SBs

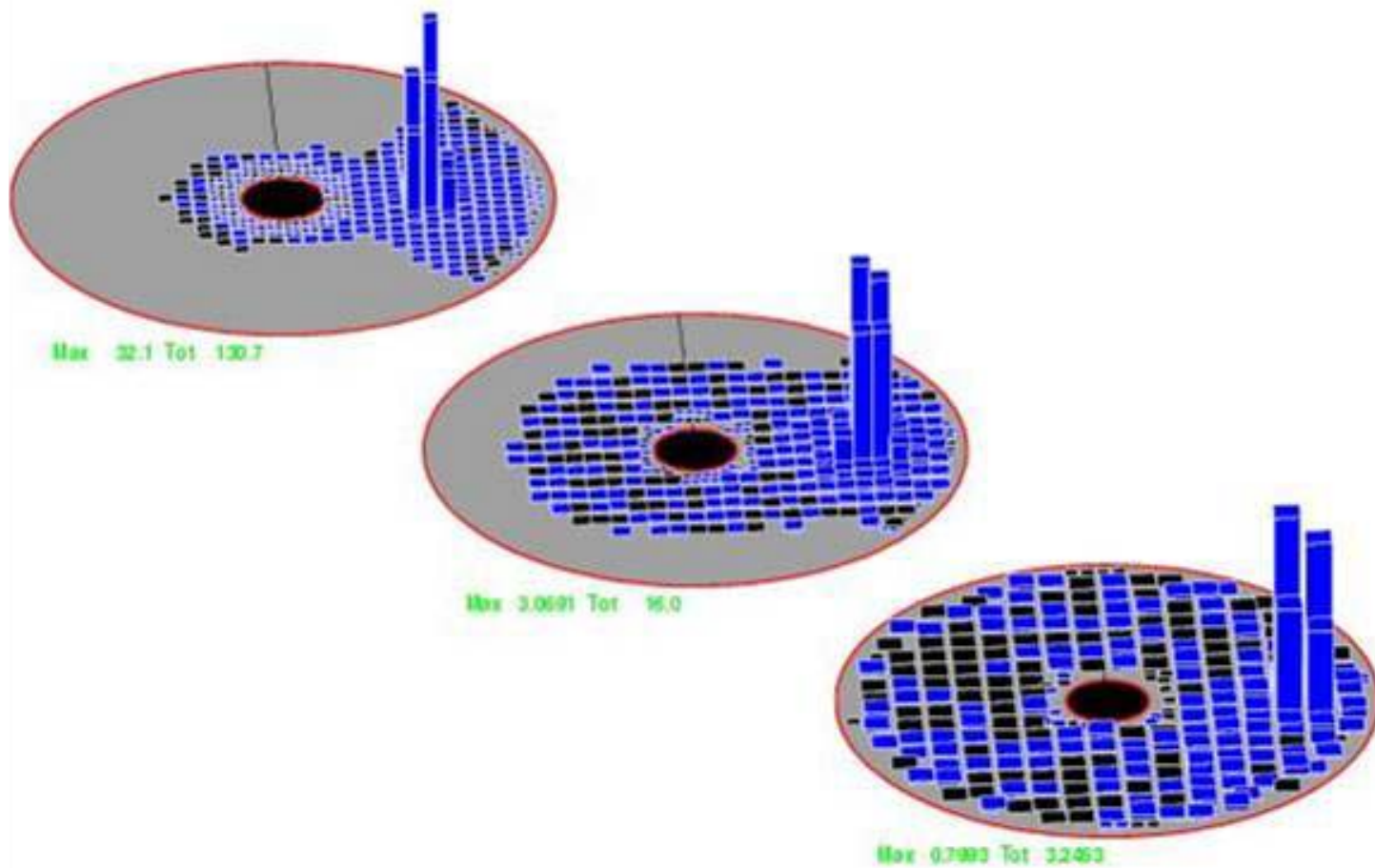


FCAL3C

(View from IP, Global Coordinates)



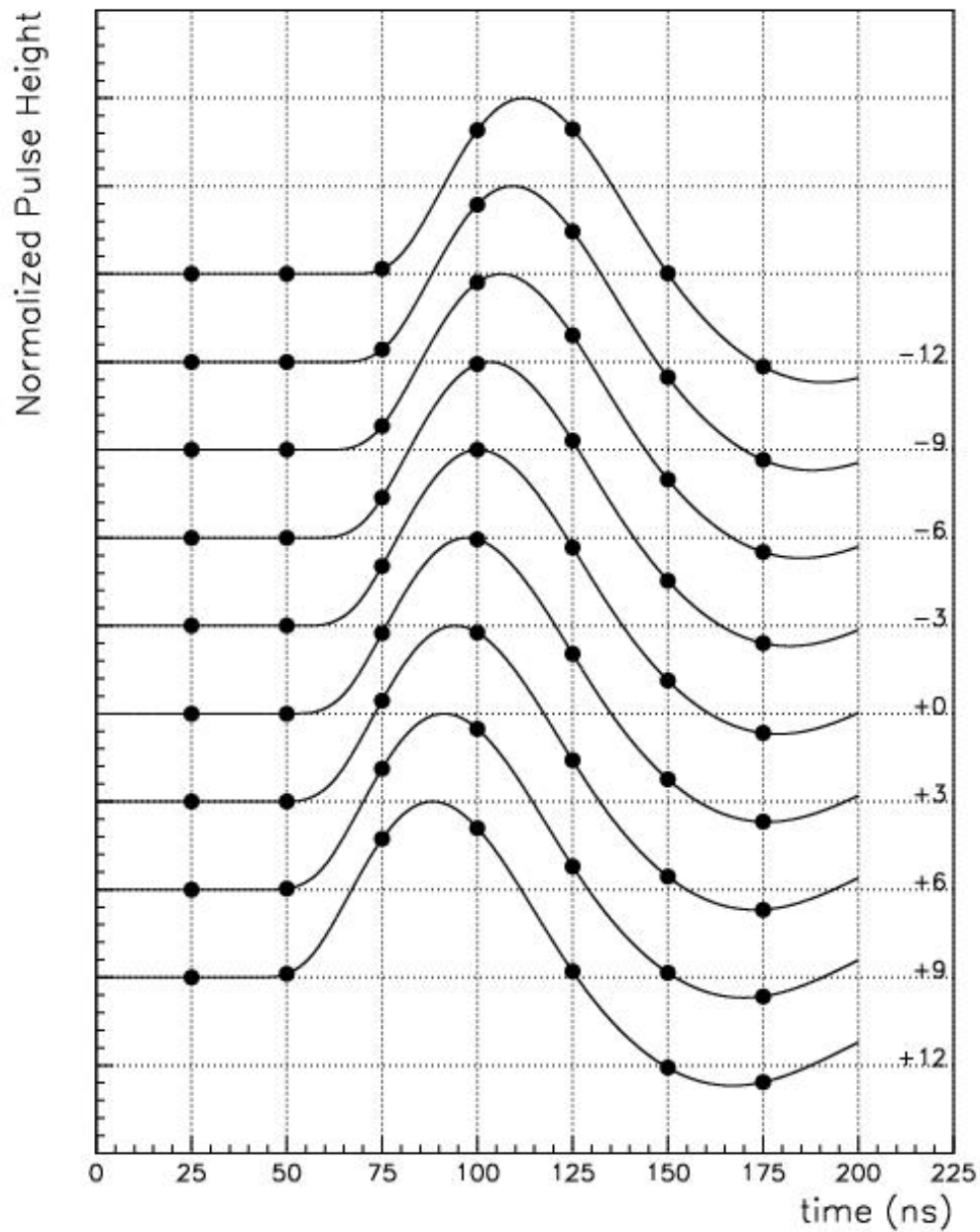
Display of Energy Deposits in FCal1, 2, and 3 due to 200 GeV π 's



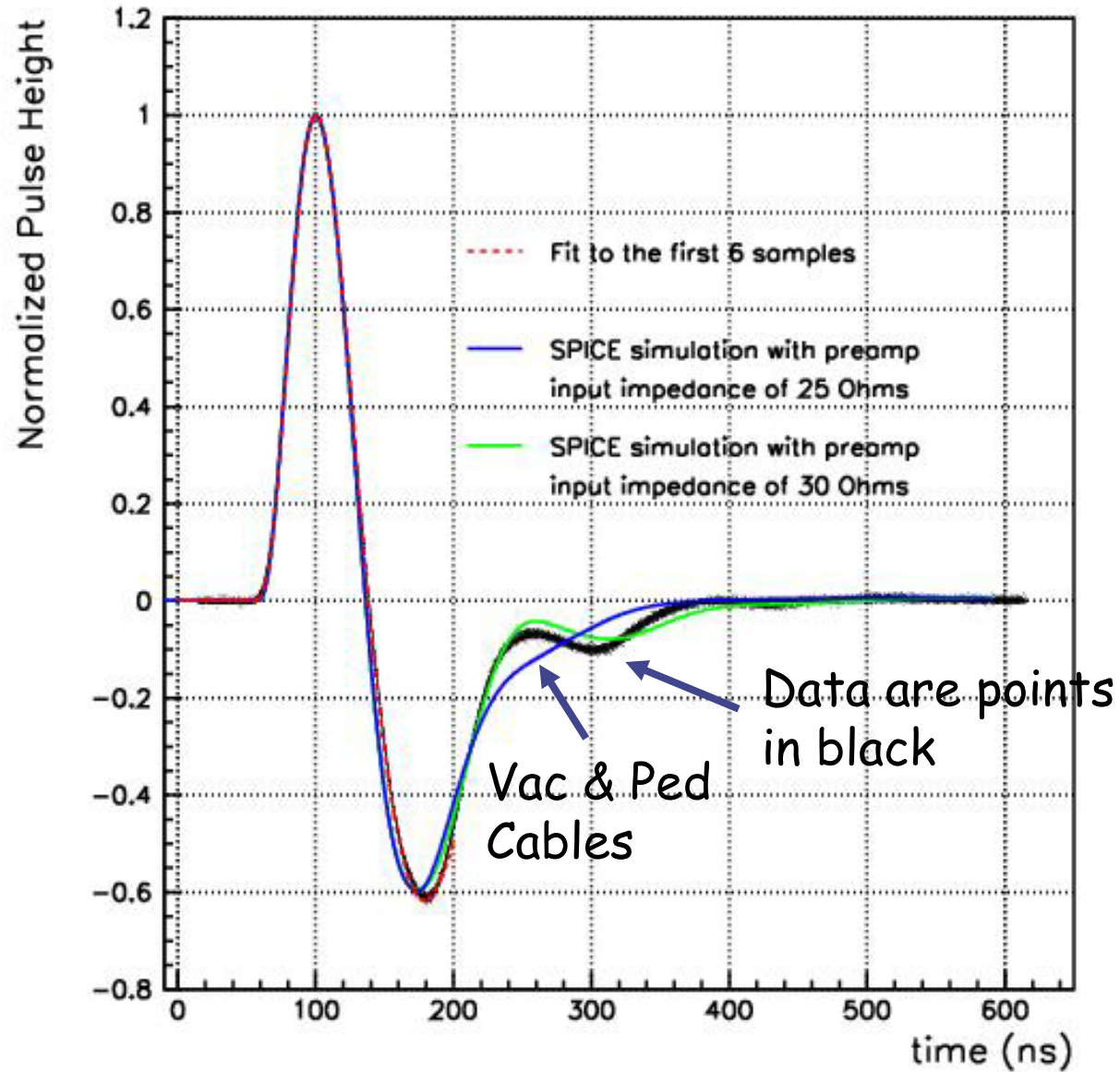
Fitting the pulse shape

- ◆ SPICE models and reflections
- ◆ Optimal filtering
- ◆ Time resolution
- ◆ What's next?

FCal1 Pulse Samples vs delay time

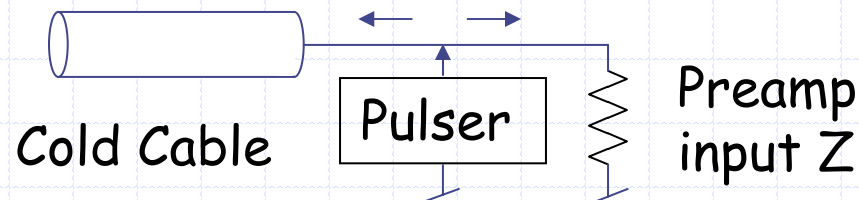


FCal1 Pulse Shape, gain 2

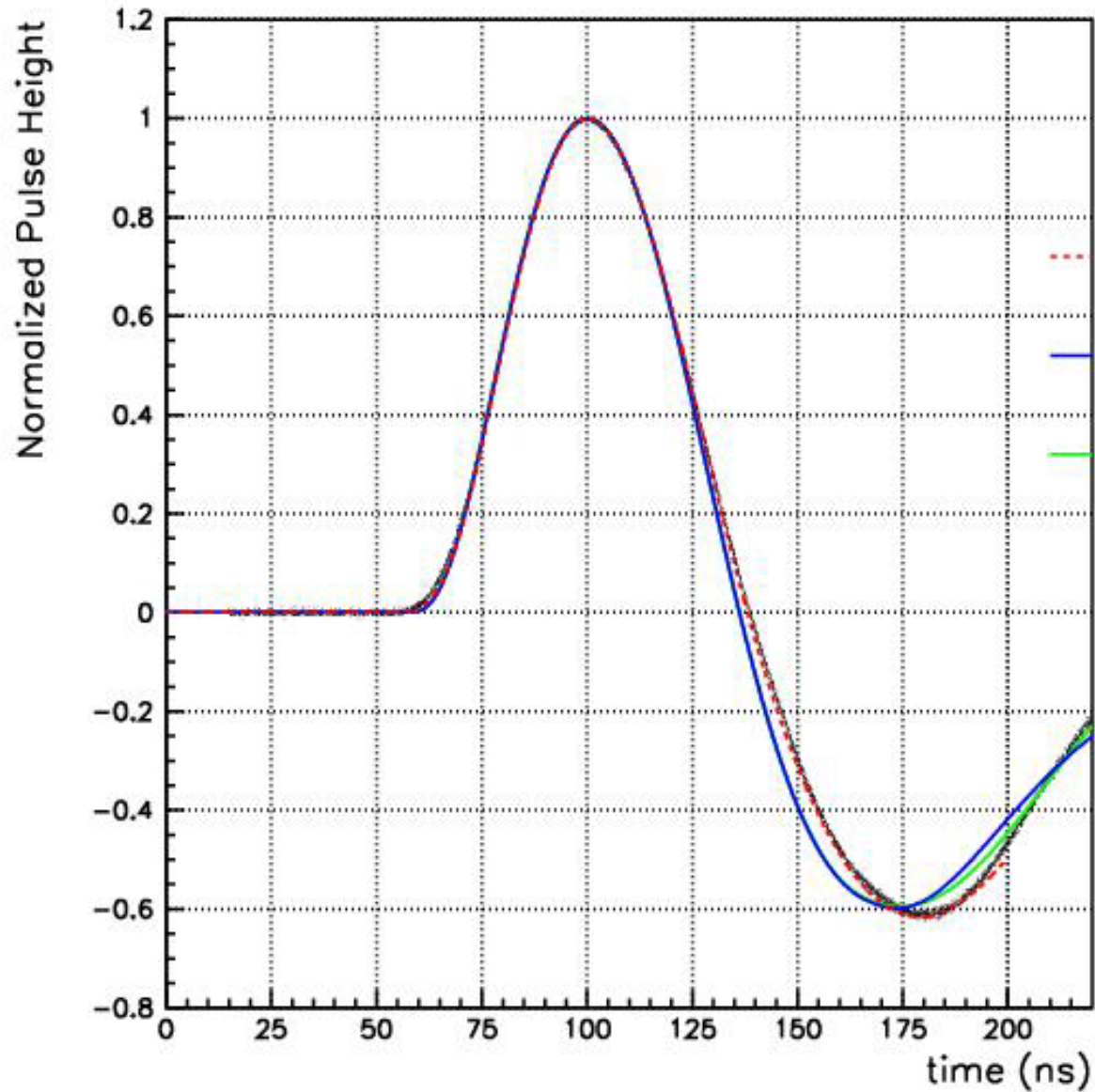


Unexpected reflection

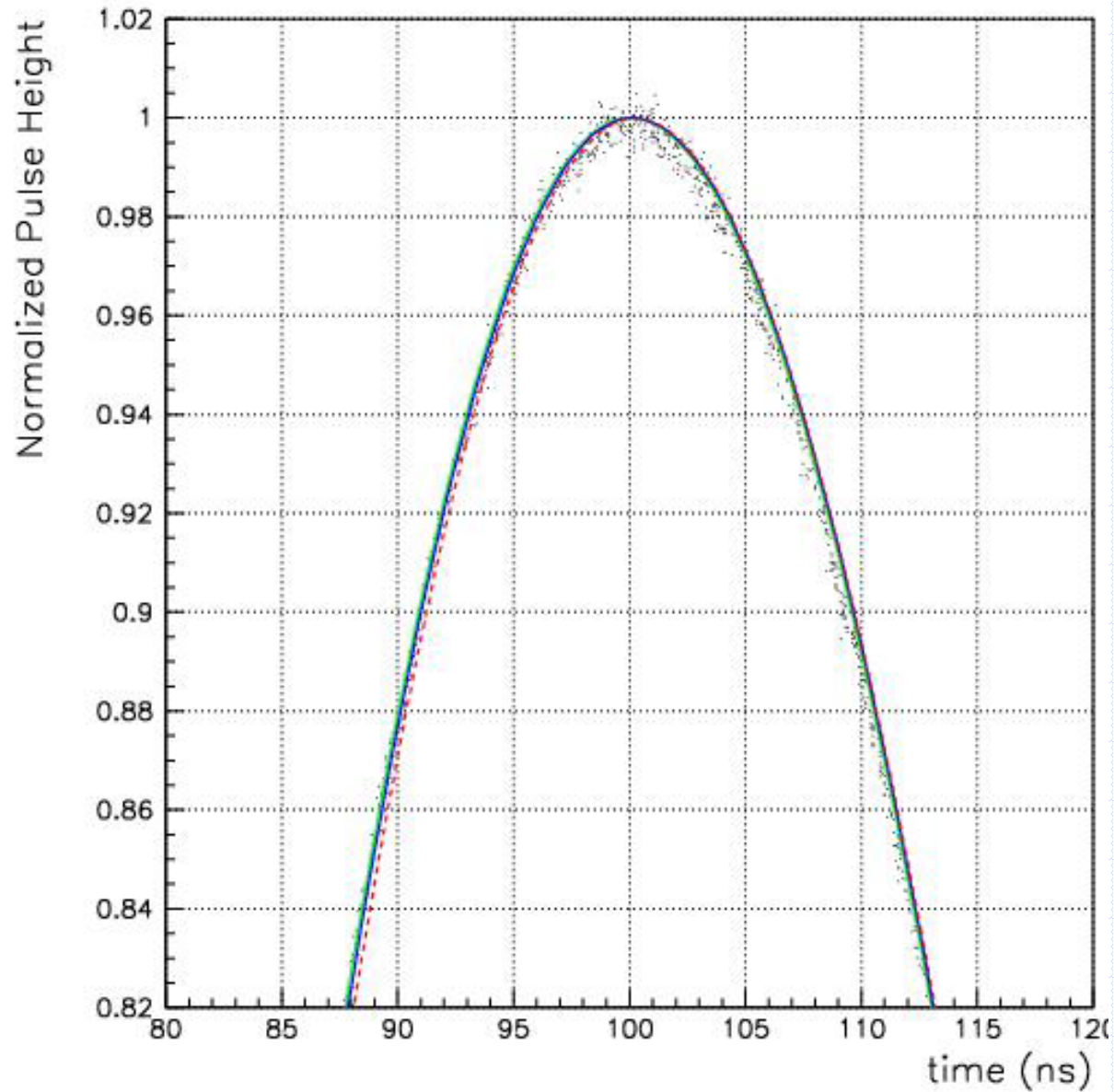
- ◆ Due to preamp input impedance?
- ◆ About 4Ω larger than cable impedance
- ◆ Consistent with pulser data
 - Ratio of response to pulser, without and with ped cables connected, should be 2.0 but is measured to be about 2.16



FCal1 Pulse Shape, gain 2

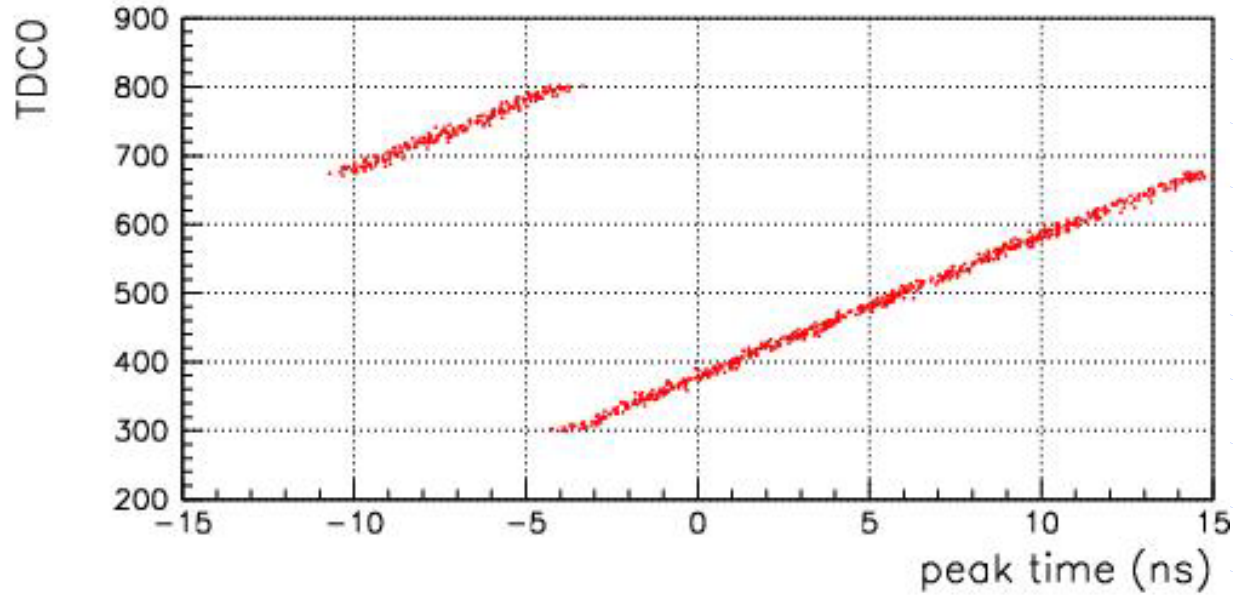


FCal1 Pulse Shape, gain 2



Close-up of
peak region

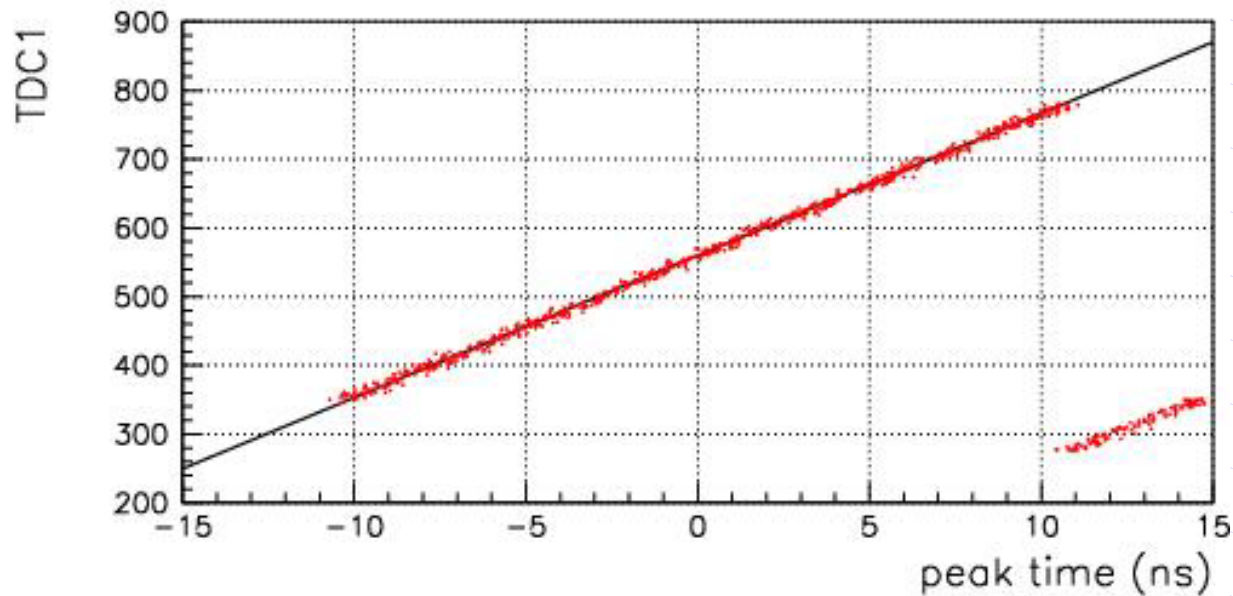
FCal1 Timing, gain 2



TDC's start on
beam counter

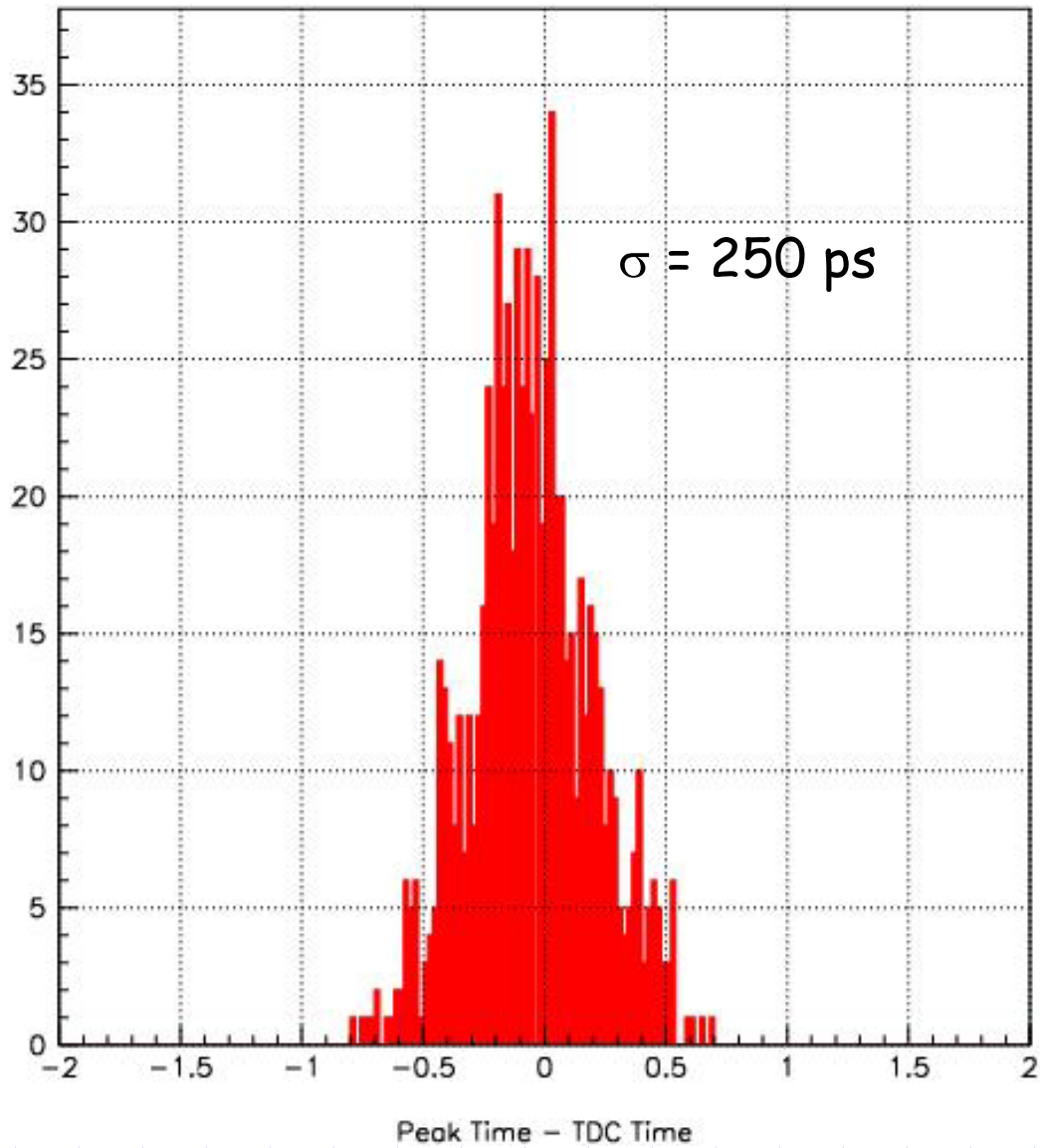
and

stop on TTC

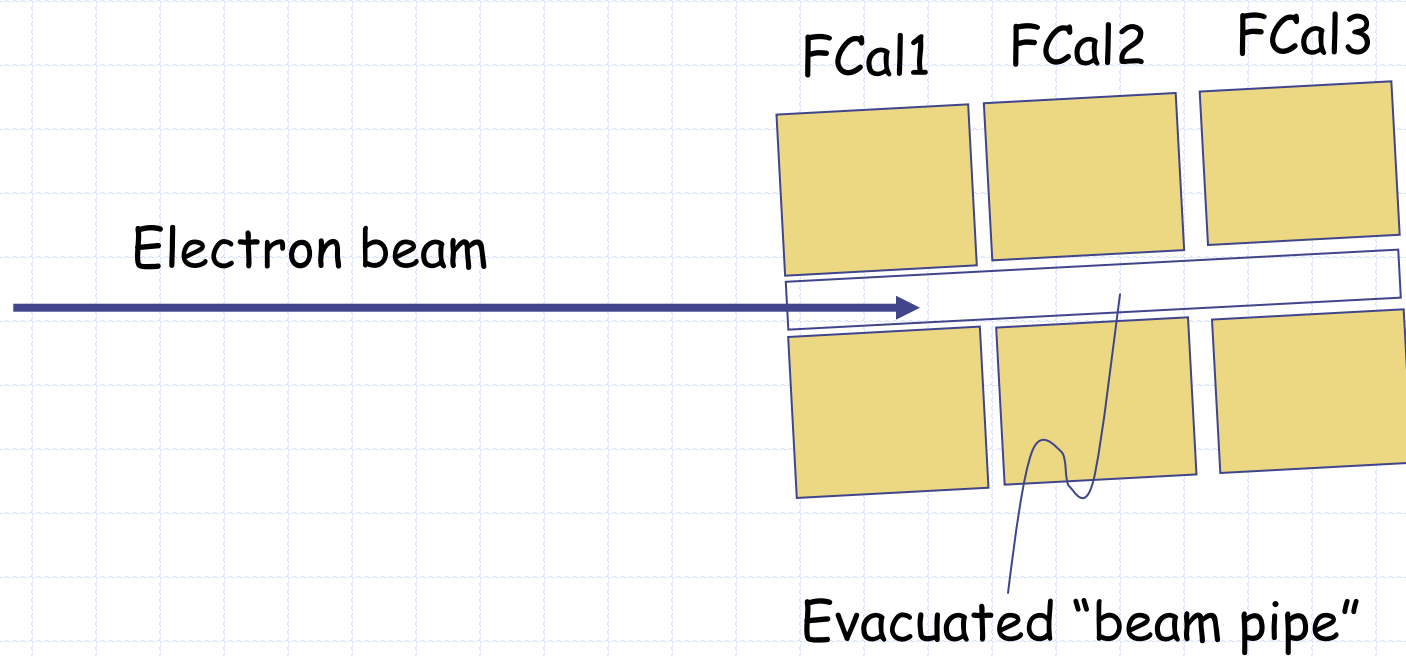


stop on
inverted TTC

FCal Timing Resolution



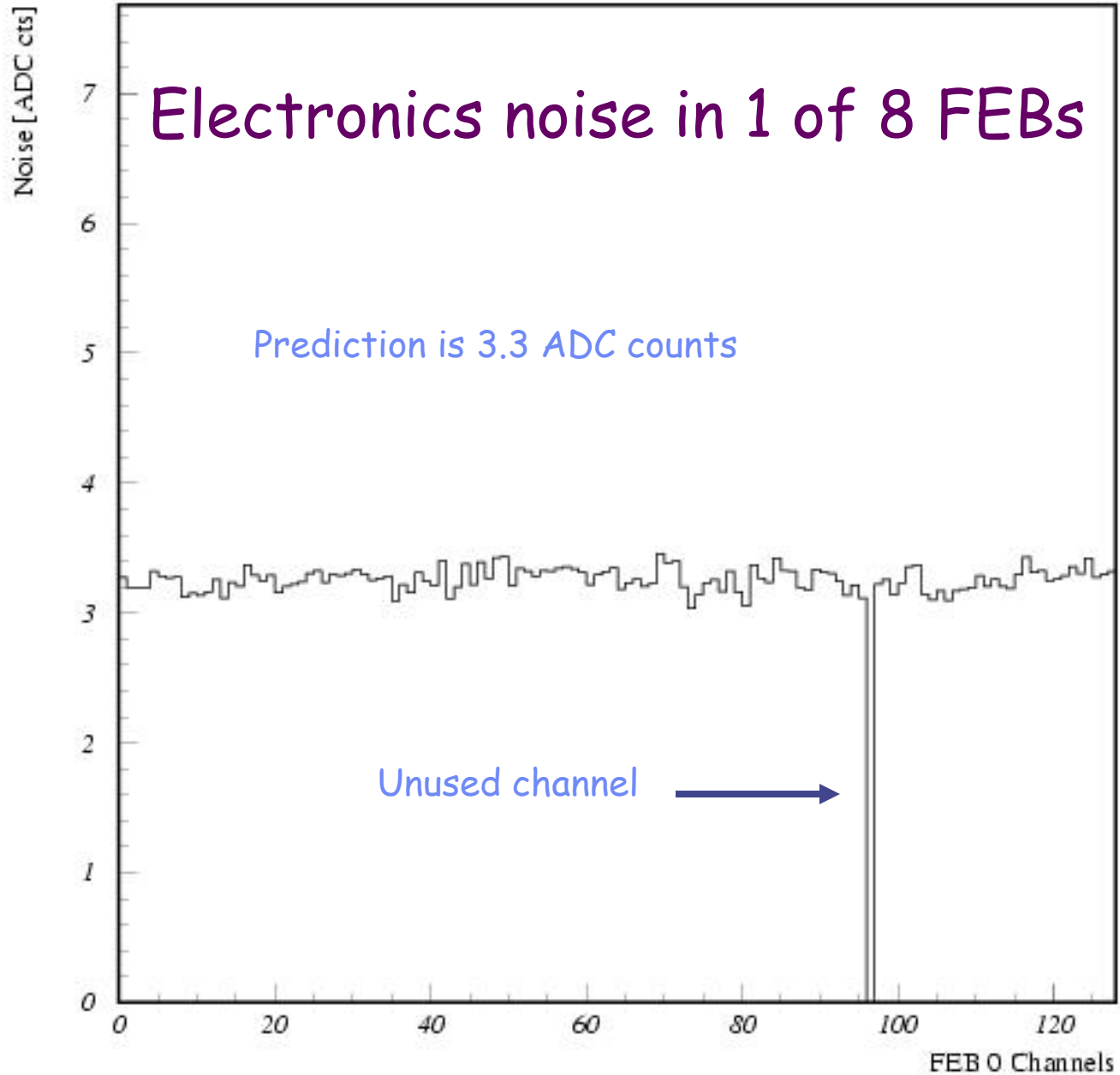
Electrons into FCal2 and FCal3



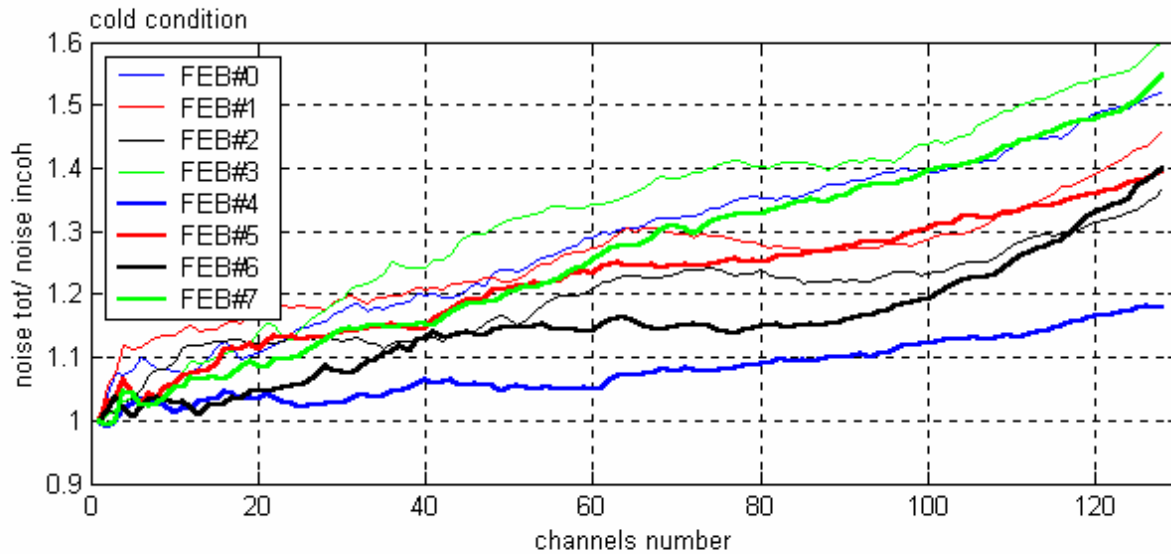
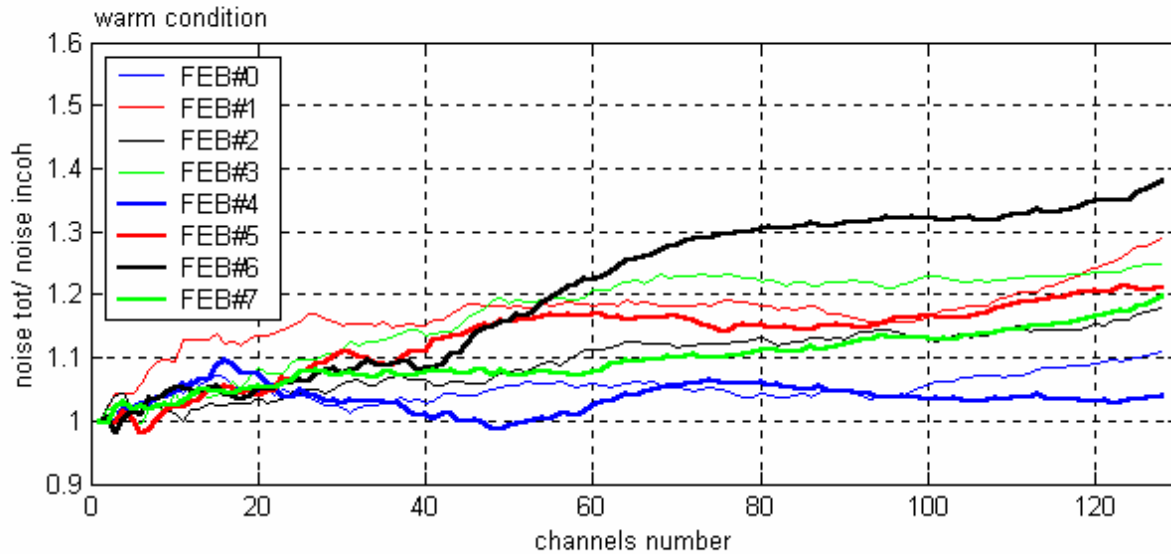
The signal Amplitude

- ◆ Electronics Noise
- ◆ Electron response
- ◆ Hadron response

Electronics noise in 1 of 8 FEBs

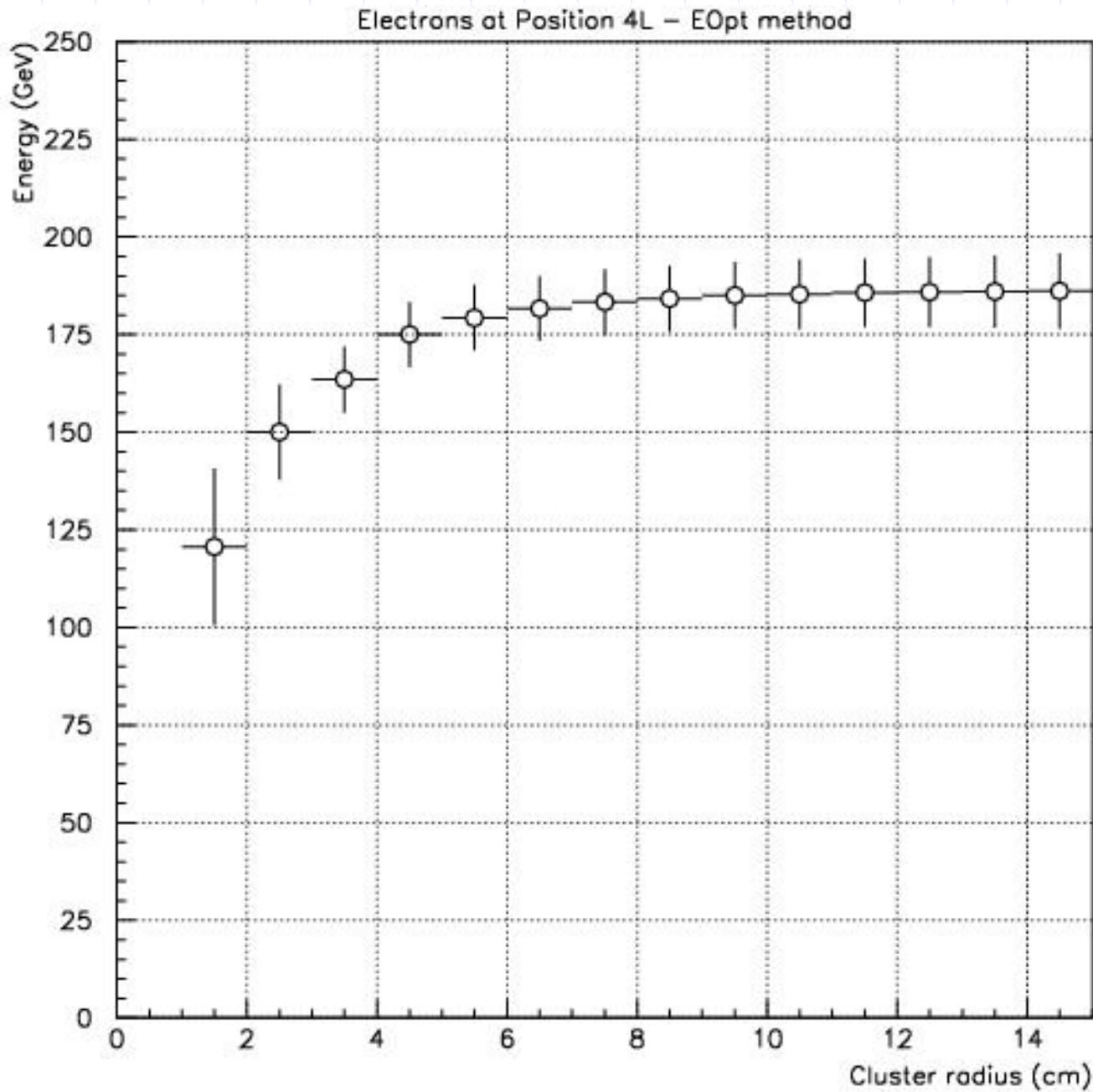


Coherent Noise



← 11%

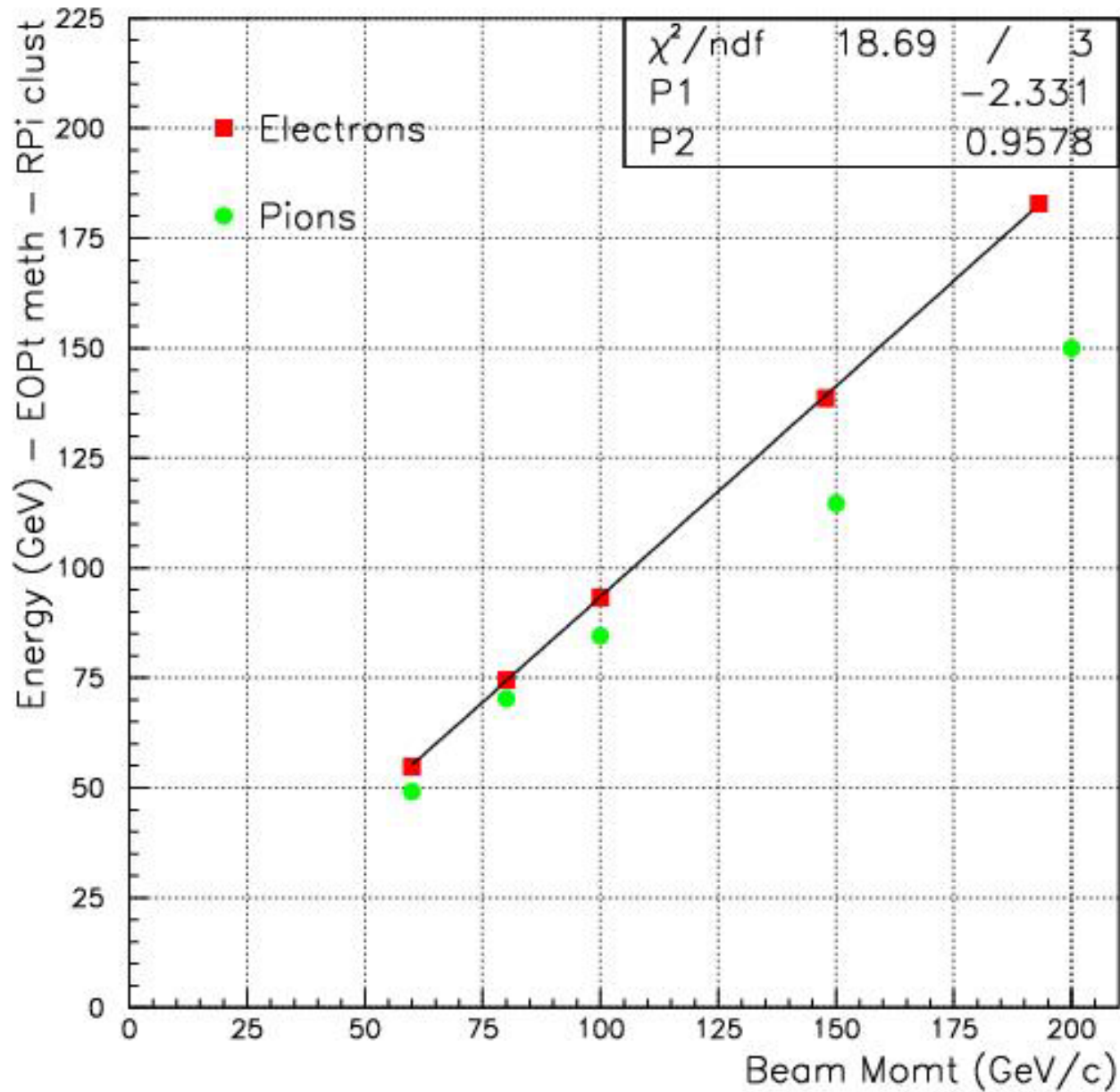
← 5.5%



193.1 GeV

$Z_{pa} = 30 \Omega$

Electrons and Pions at Position 4L - Fit Electrons



What's next?

- ◆ Improve SPICE model and
 - Better understand the pulse shape
 - Better understand the pulse amplitude
- ◆ Improve timing resolution (correct for light transit time in scintillator)
- ◆ Make optimal use of pulser data
- ◆ Repeat the standard analyses we do with test beam data