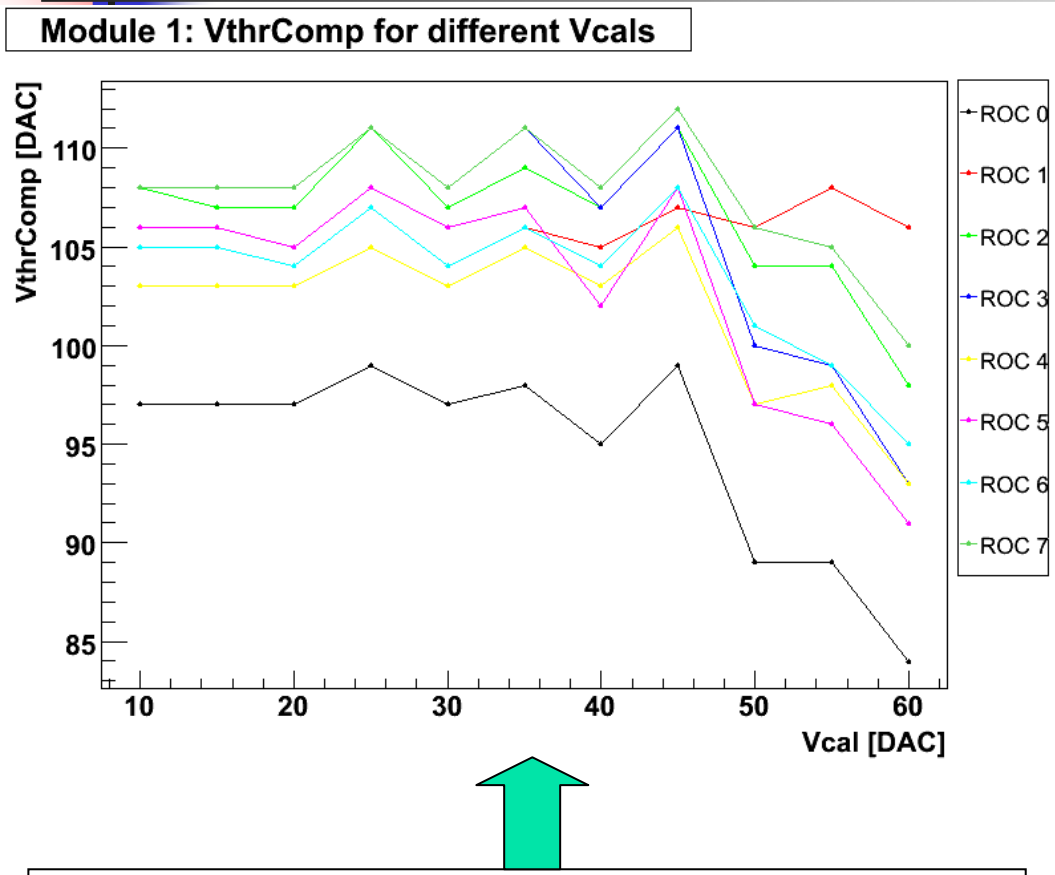
PIRE Conference 9.18.09

Ali McVea

Trimming Results

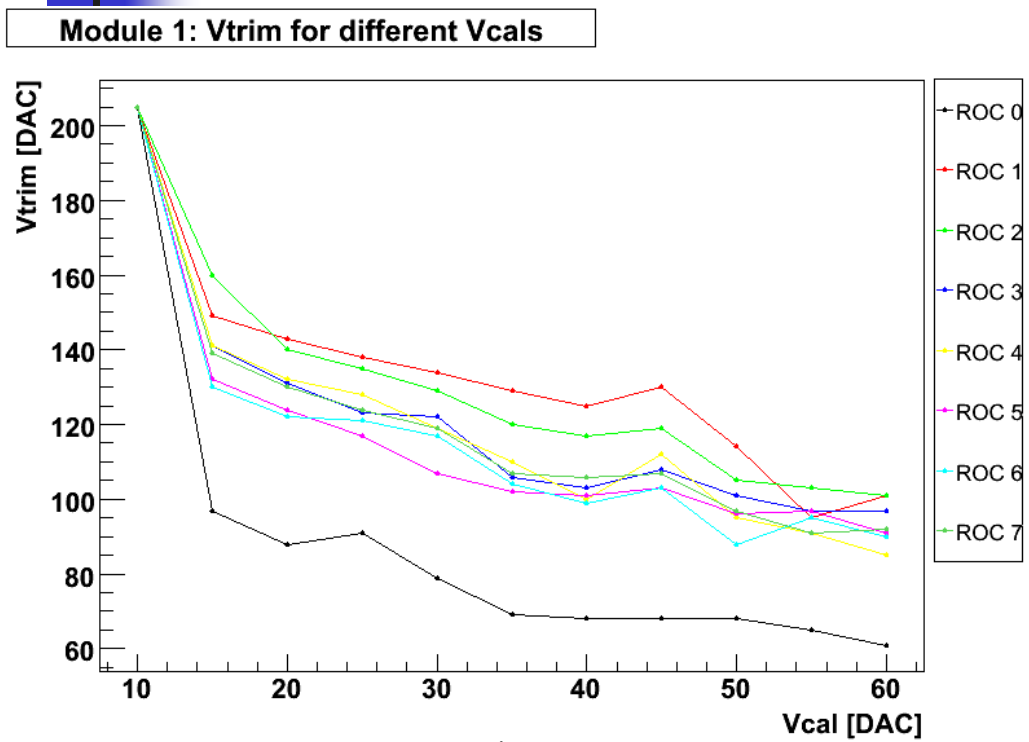
Step 1: VthrComp vs Vcal



VthrComp changes after trimming at different Vcal values for 8 ROCs in module 1

- Aimed to find global threshold for the ROC
- Varied Vcal
- Changes expected
  - Change in global threshold
- Selected maximum value
  - Saved as global threshold

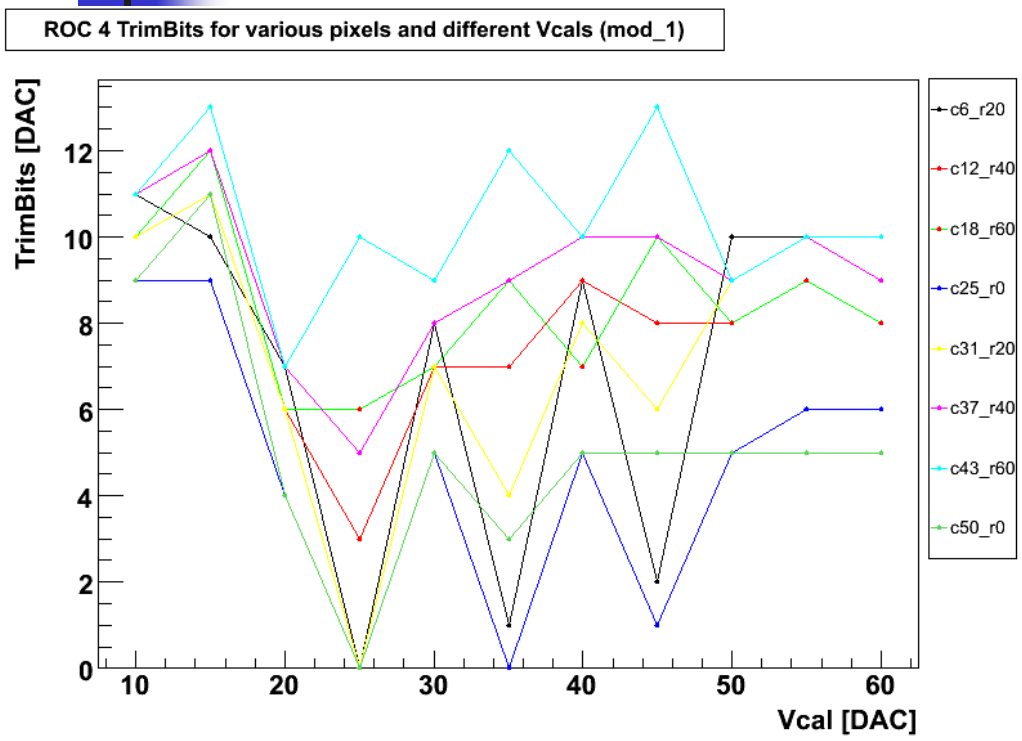
Step 2: Vtrim vs Vcal



Vtrim changes after trimming at different Vcal values for 8 ROCs in module 1

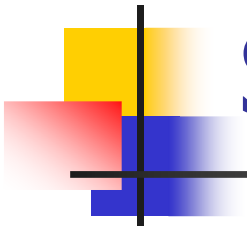
- Now, using fixed VthrComp value from previous step
- Perform a Vcal scan
- Pixel with highest Vcal is selected to determine Vtrim
- Trim voltage increased until Vcal reaches the value from Vcal scan
- Changes expected
  - Global threshold lowered

Step 3: Trim Bits vs Vcal



Trim bits numbers for different pixels after trimming at different Vcal values

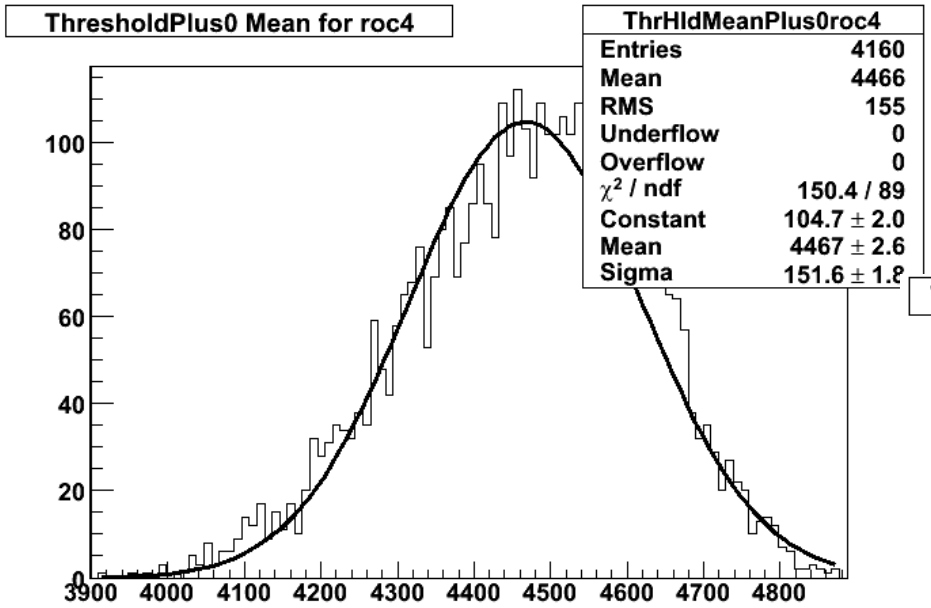
- Next, finding trim state
- Change trim bits until pixel responds to target Vcal value (previous step)
- Assumed global threshold for each ROC should be similar
- Left, shows that the trim bits DO change with changing threshold



SCurve Test

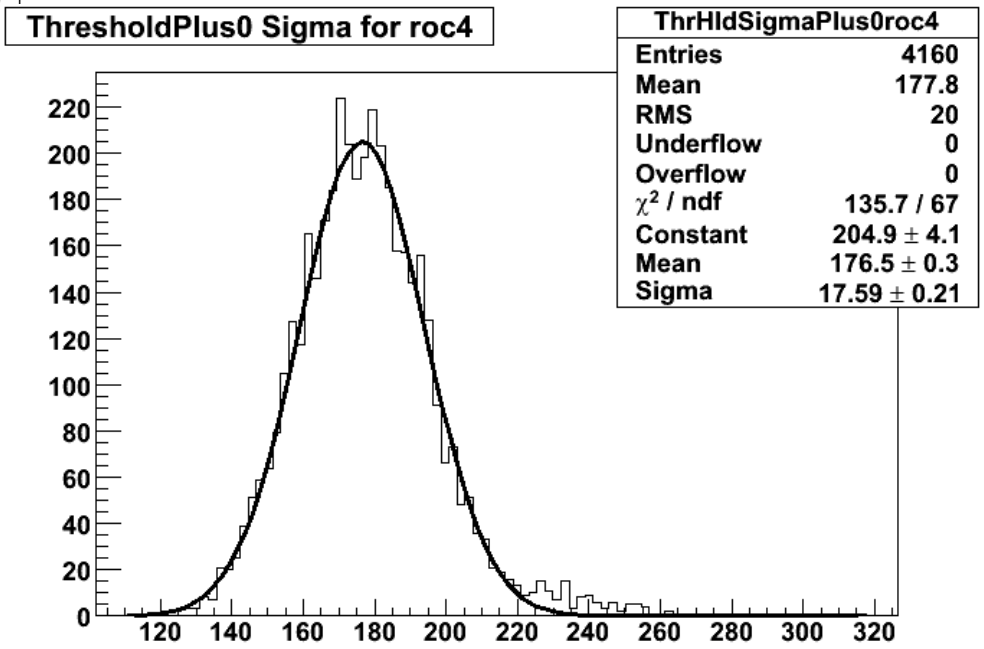
- To test if the changing trim bits were significant
  - Study SCurve behavior at varying VthrComp values
- Procedure:
  - Trim at Vcal 60
  - Trimming procedure sets a fixed VthrComp value for each ROC
  - Change this VthrComp value
  - Run SCurve test

Threshold and Noise for Original VthrComp Value

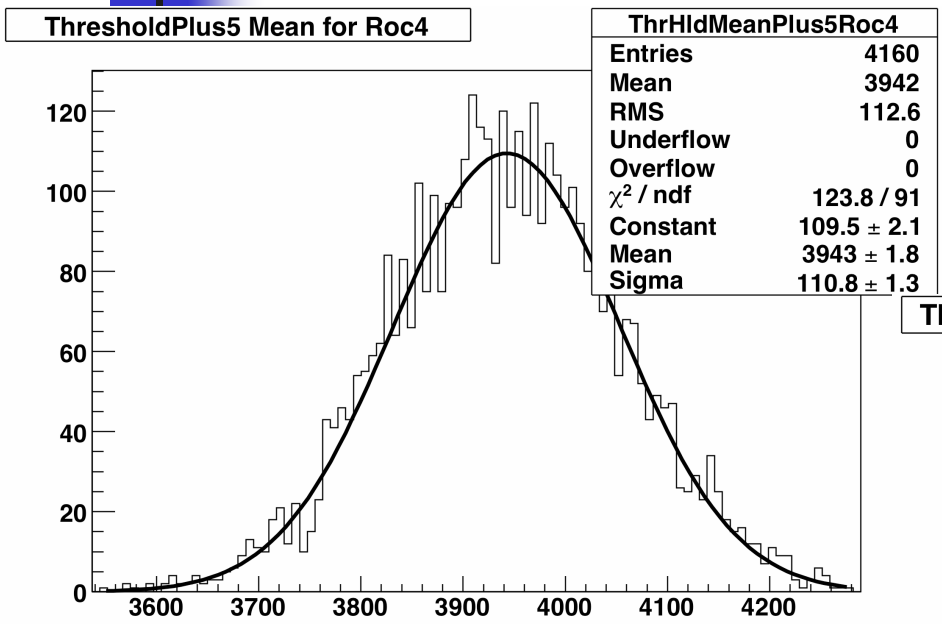


Threshold mean graph for original VthrComp value (ROC 4)

Threshold sigma graph for original VthrComp value (ROC 4)

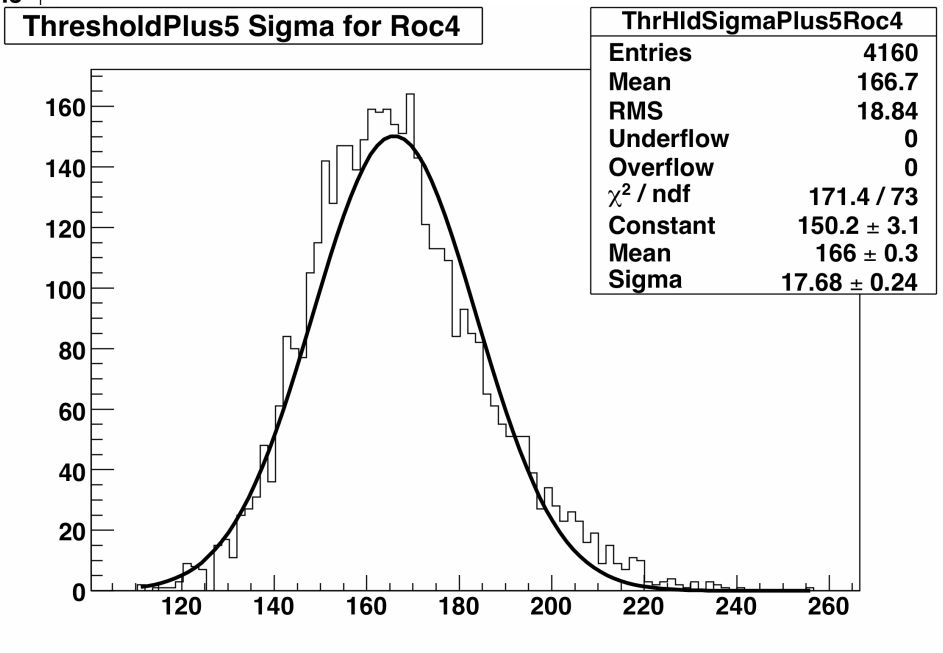


Threshold and Noise for VthrComp+5

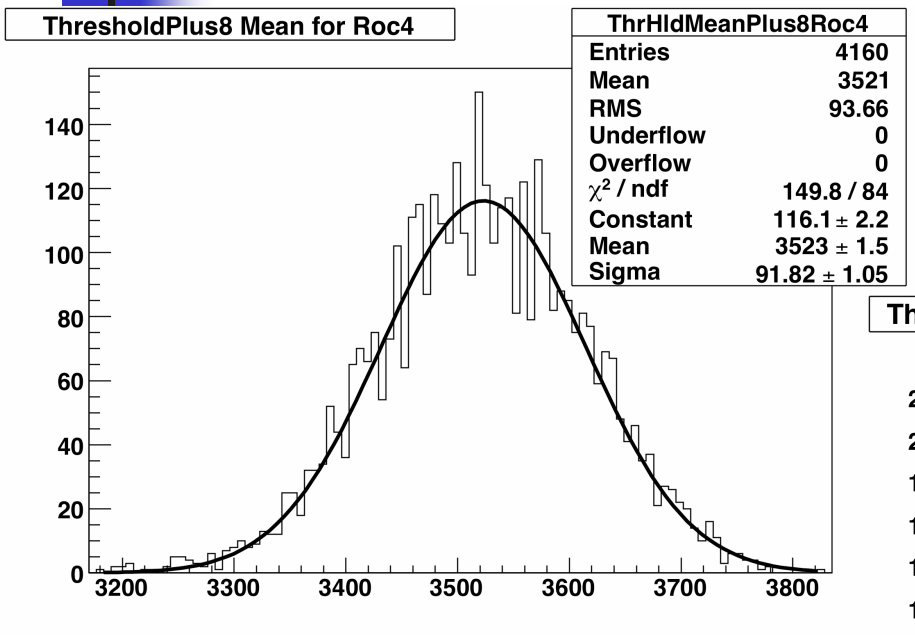


Threshold mean graph after adding 5 DAC units to VthrComp (ROC 4)

Threshold sigma graph after adding 5 DAC units to VthrComp (ROC 4)

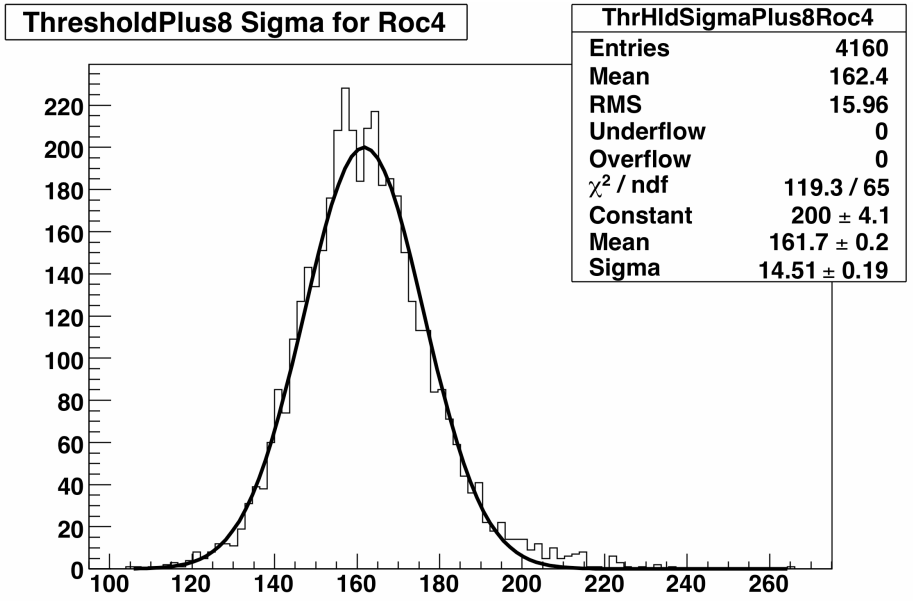


Threshold and Noise for VthrComp+8

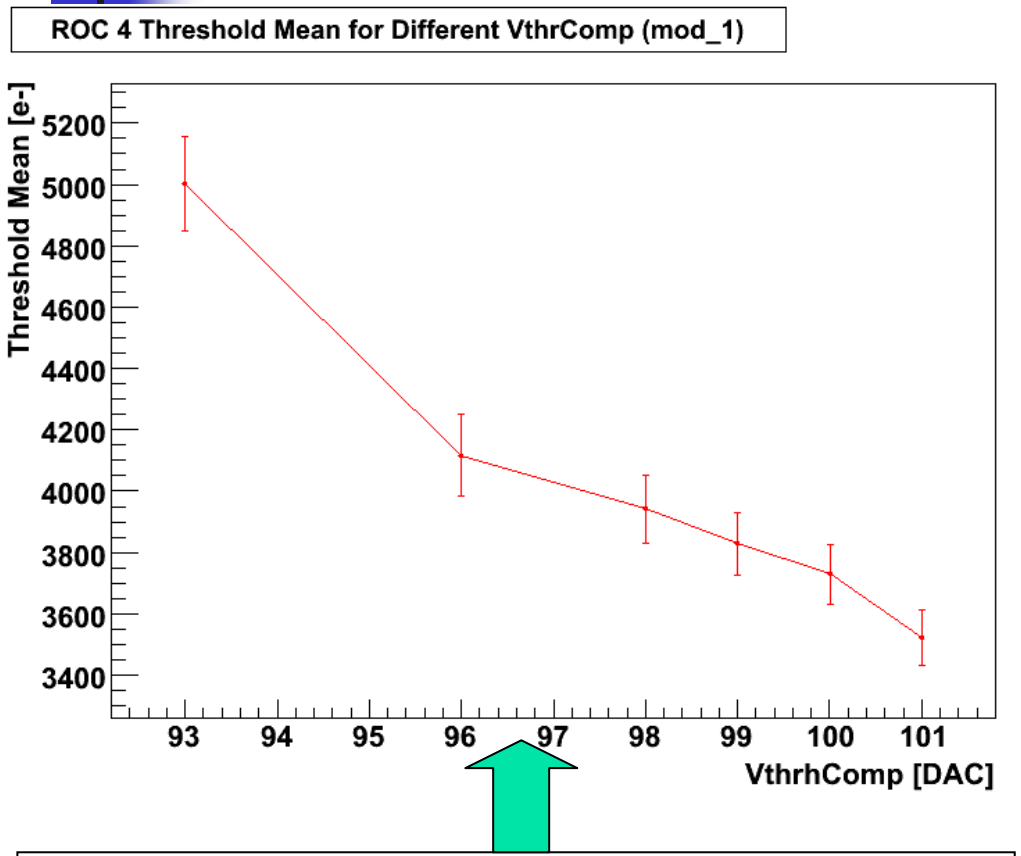


Threshold mean graph after adding 8 DAC units to VthrComp (ROC 4)

Threshold sigma graph after adding 8 DAC units to VthrComp (ROC 4)



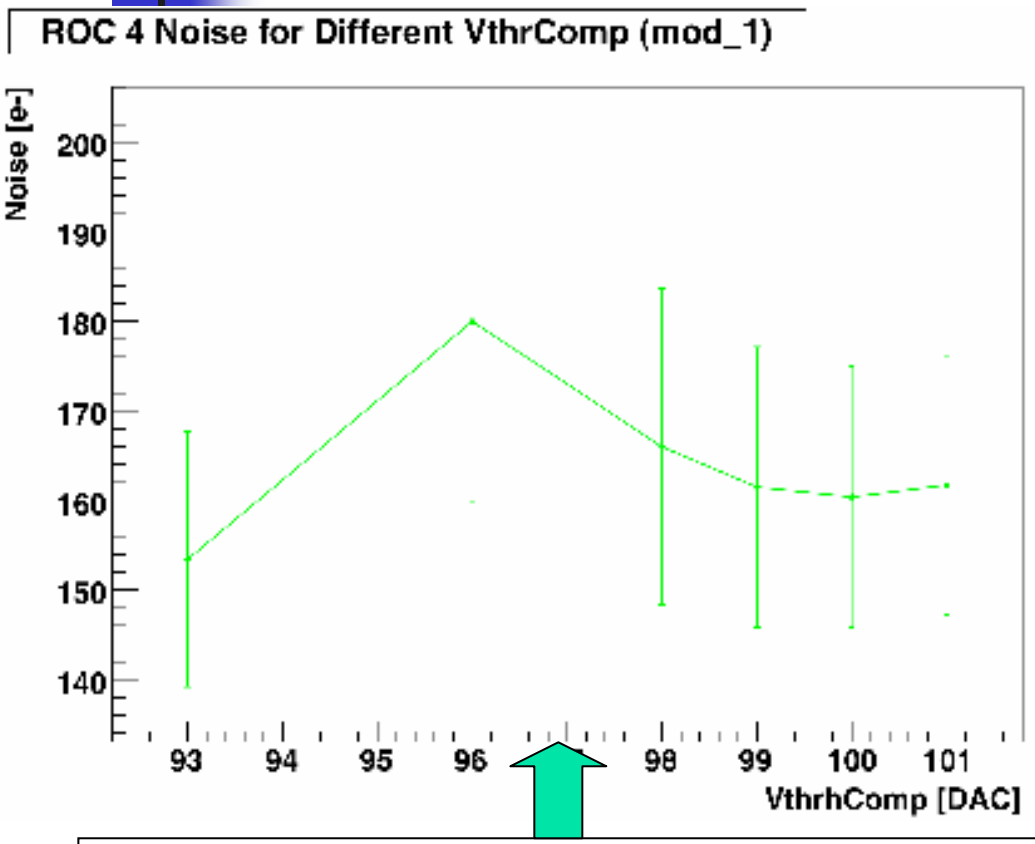
Changes in Threshold



Threshold values (DAC units) for the various VthrComp values (ROC 4)

- Threshold values for the various VthrComp values
- Increasing VthrComp results in decreased threshold mean values
- Expected
- Error bars show the width of the threshold mean Gaussian

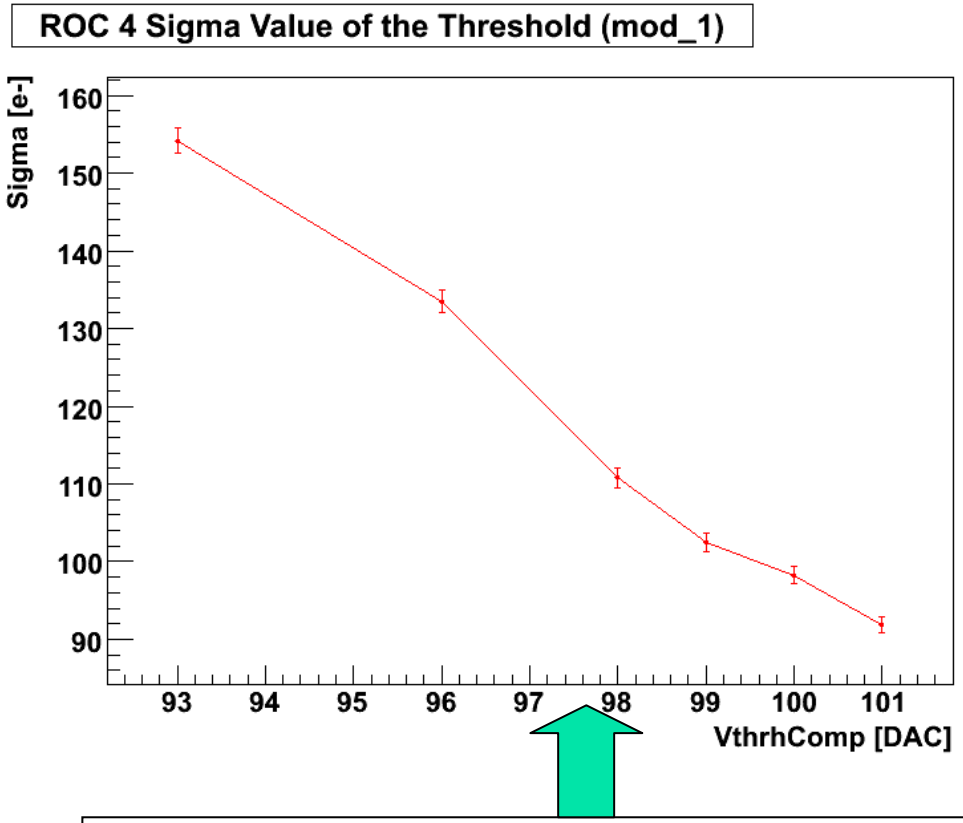
Changes in Noise



Noise changes as increasing VthrComp value (ROC 4)

- Noise for the various VthrComp values
- Mostly the similar
- Large error bars
  - Width of the threshold sigma Gaussian

Sigma Value for Threshold



Changes in the width of the threshold mean Gaussian with increasing VthrComp (ROC 4)

- Sigma values for the varying VthrComp values
- Expected, increasing VthrComp would "untrim"
- The width of the threshold Gaussian is narrowing

What's Happening Now…

- Due to strange behavior in threshold sigma:
  - Trim modules at the each VthrComp value
  - Rerun the SCurve test
  - Compare the threshold and sigma values