3x FBK bias scan DCEM 1.31

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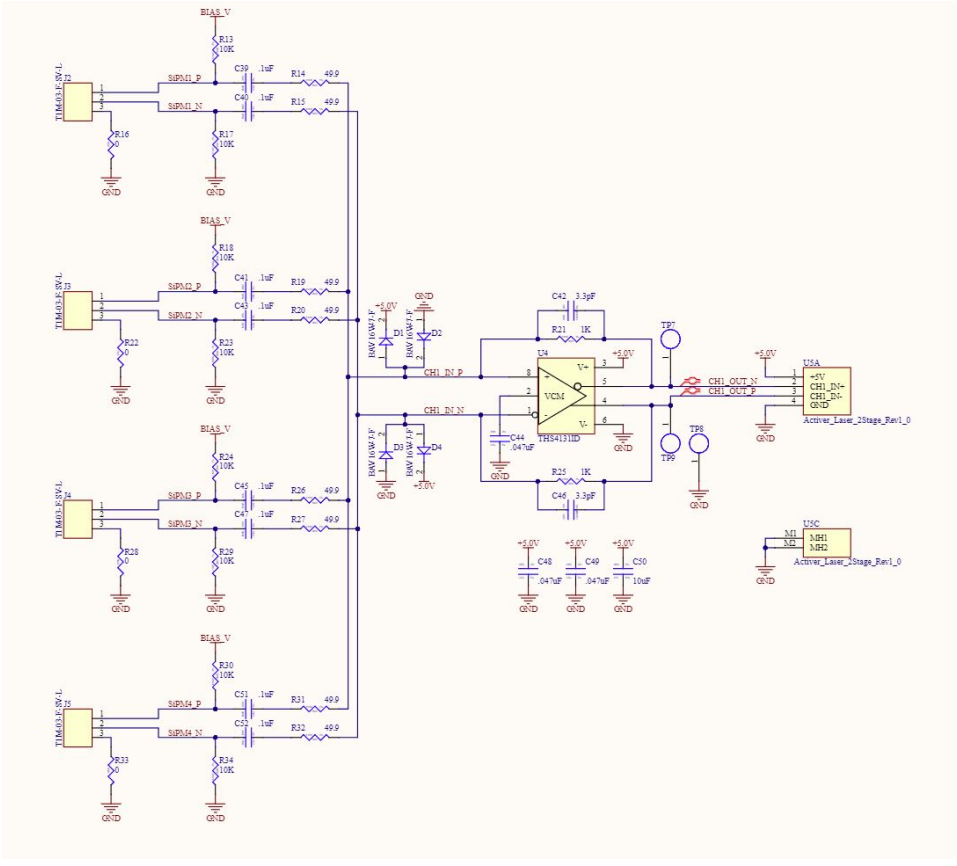
FPK + CMOS config

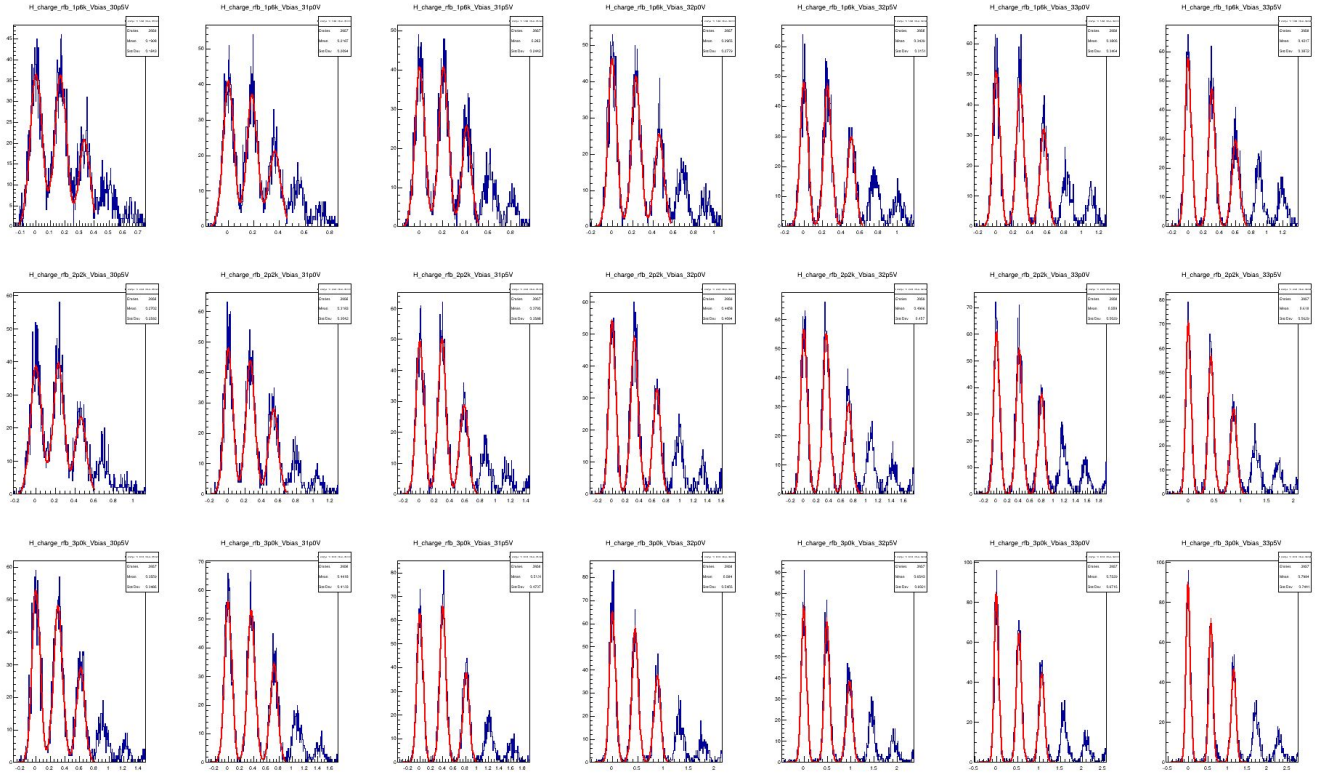


- 3x FBK
  - Better SNR than 4x
- PoC Bias scan + First stage differential amplification gain scan
- SPE amplitude linear with bias and first amplification stage gain
- SNR non linear in first amplification stage gain

Scan in both bias voltage and 1st stage gain hists:

Feedback Resistor Values:
1.6k Ω, 2.4k Ω, 3.0k Ω

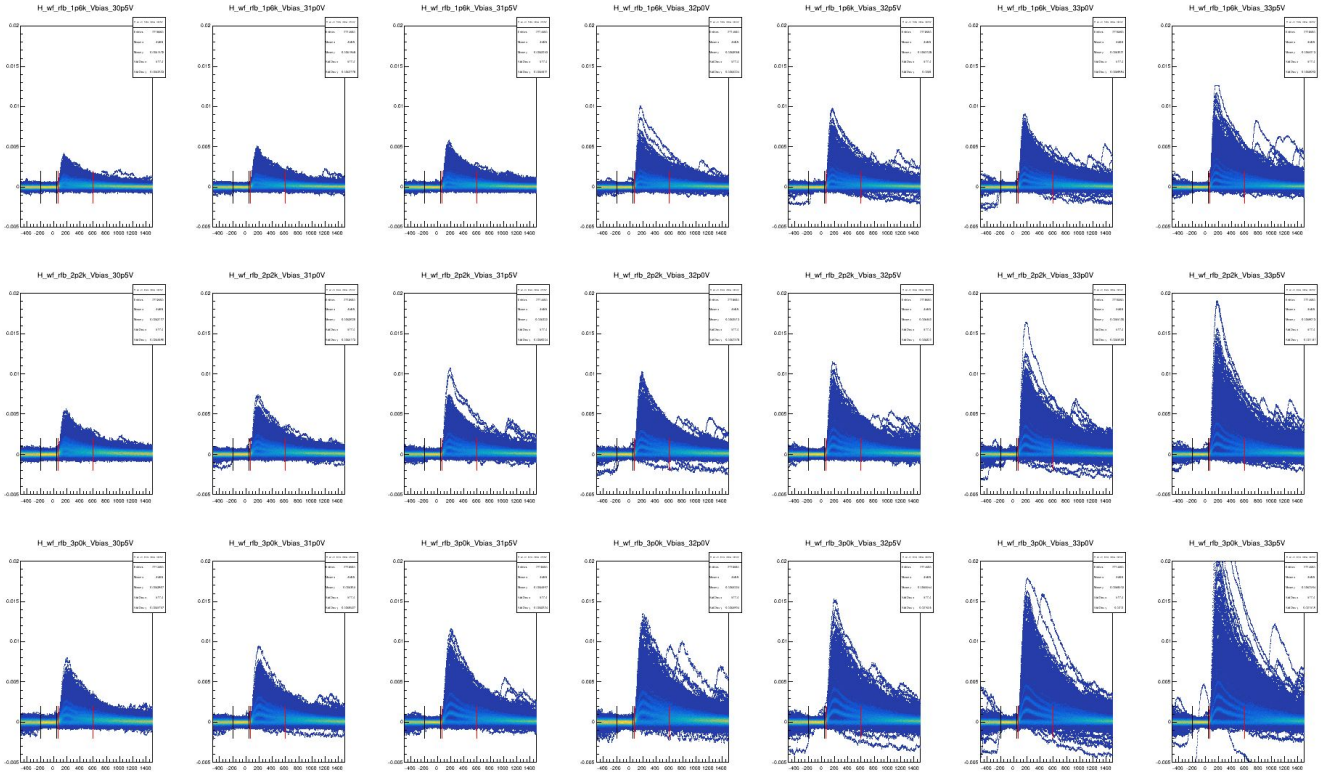
Bias Values:
30.5V, 31V, 31.5V, 32V, 32.5V, 33V, 33.5V



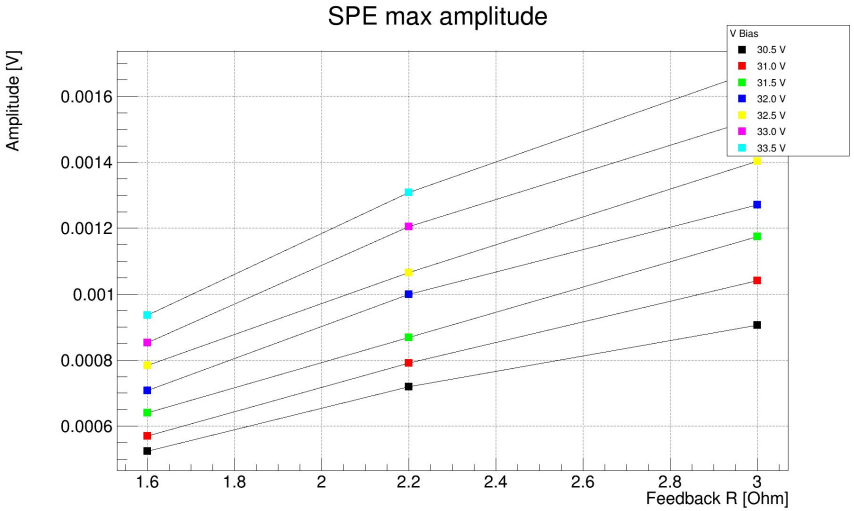
Scan in both bias voltage and 1st stage gain persistent:

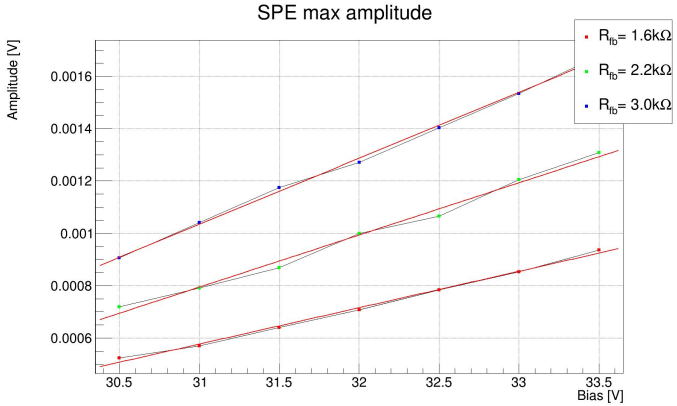
Feedback Resistor Values:
1.6k Ω, 2.4k Ω, 3.0k Ω

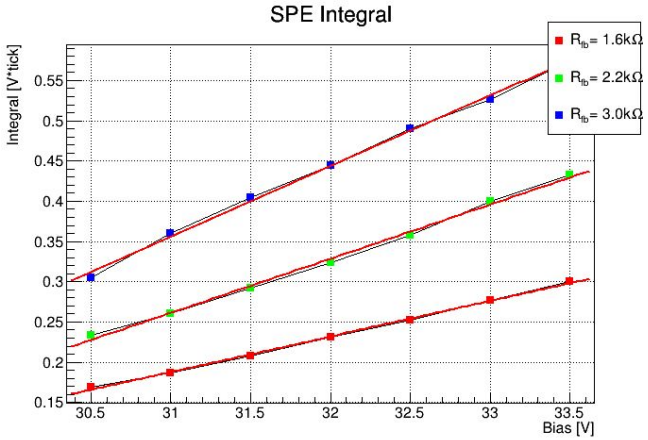
Bias Values:
30.5V, 31V, 31.5V, 32V, 32.5V, 33V, 33.5V



SPE integral and amplitude



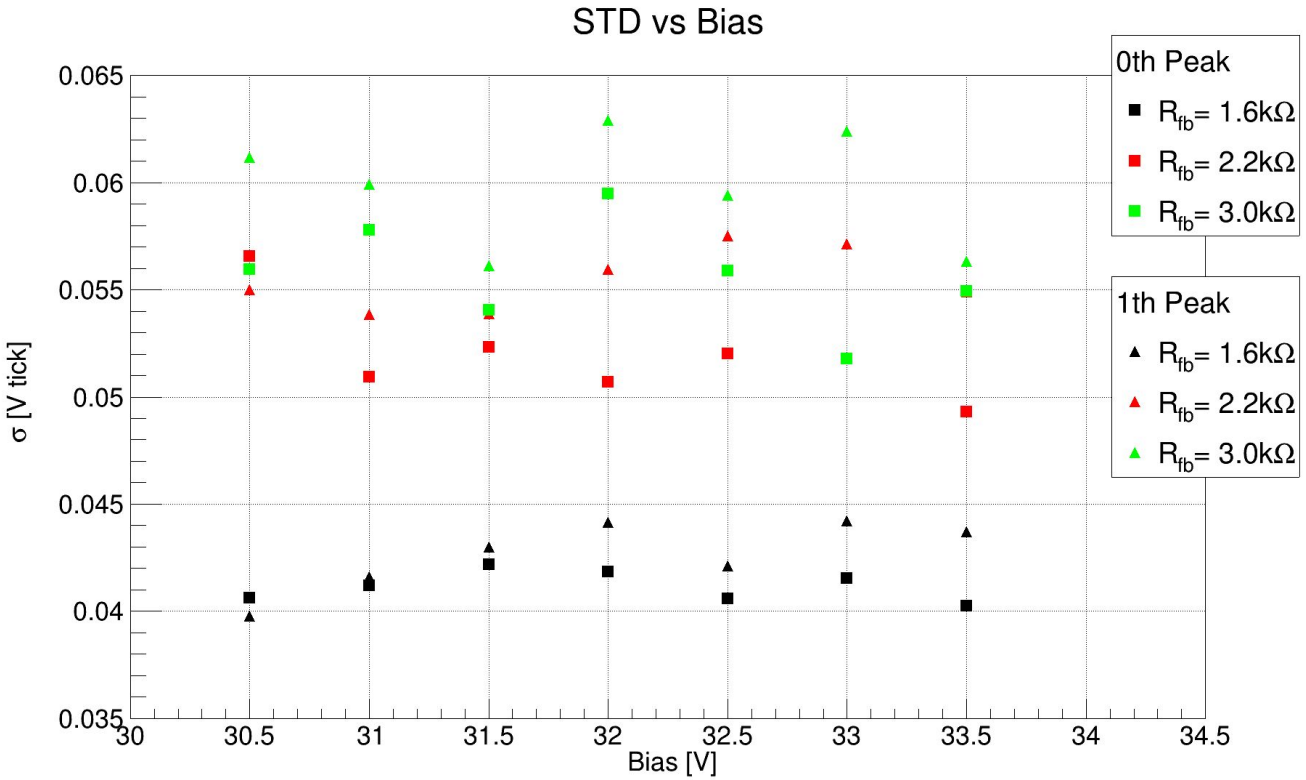




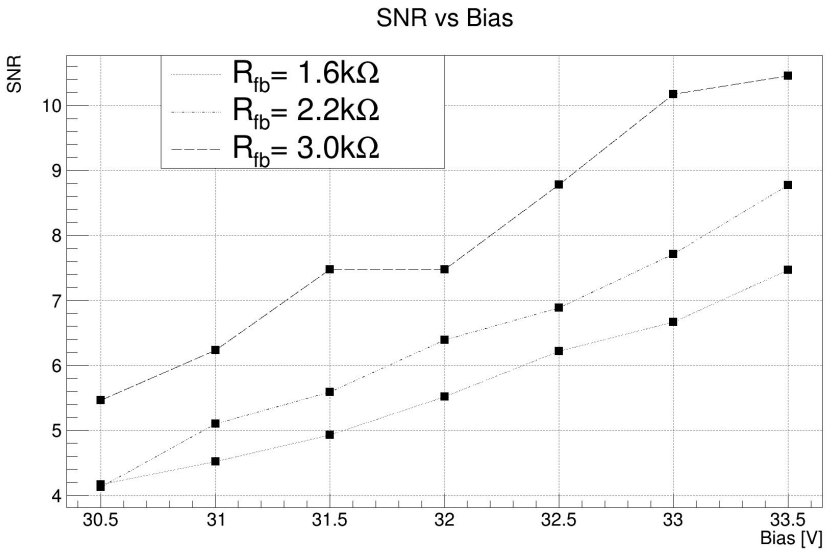
- SPE amplitude and SPE integral increase linearly (mostly) with feedback resistor and bias

STD of 0th and 1st peak vs Bias for Feedback Resistor

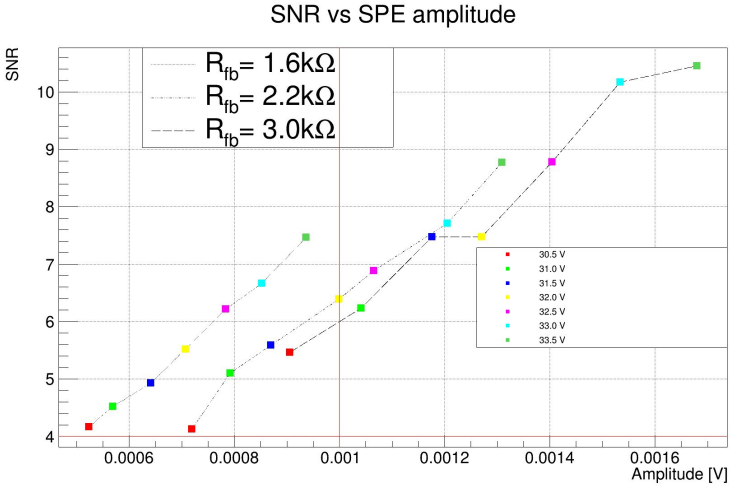
- STD of 0th and 1st peaks constant with bias
  - Some fluctuation
  - Not linear in feedback resistor
- Done with 3x FBK, 4x FBK expected to have same trend, different values
- STD non linear with R_fb, SPE integral is



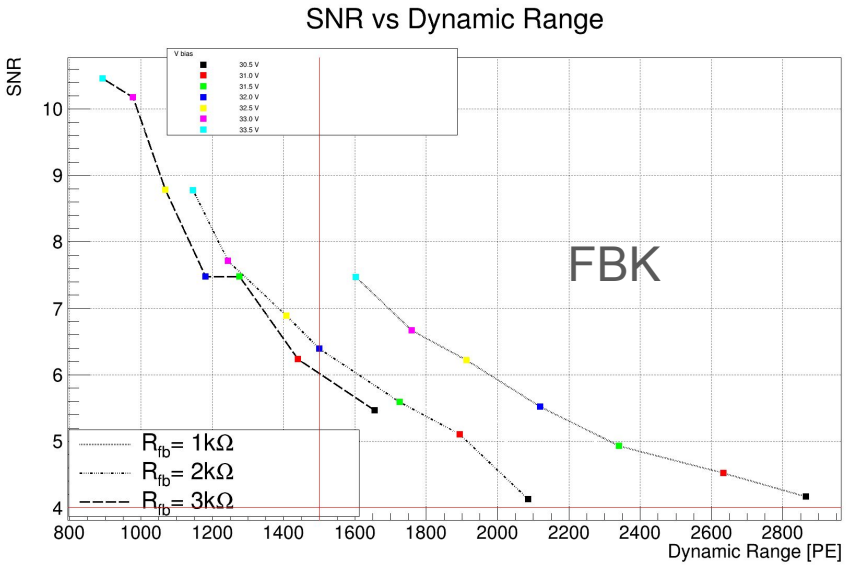
SNR



- SNR linear with Bias & Amp
- Trends expected to stay same, SNR values to change from 3x->4x FBK



SNR vs DNR



- Expected behavior, similar to HPK