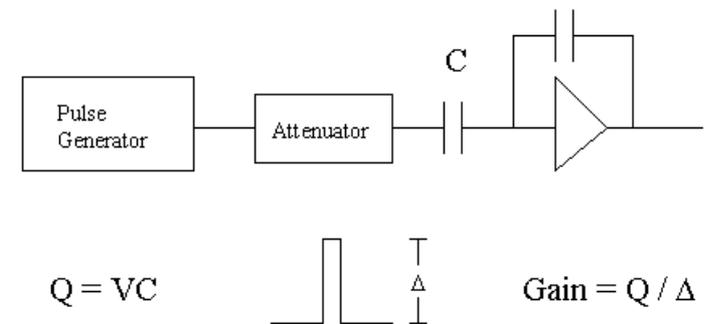




Preamplifier Measurements

- **Gain**
 - 4.4 mV/fC [spec. > 3.3 mV/fC]
 - Uniformity better than 1%
 - Operates with 10-50 pF load
- **Equivalent Noise Charge (ENC)**
 - For fixed rise time $\tau = 69$ ns with $C=40$ pF
 - Measured 2025 e [spec. < 2000 e]
 - ENC $\approx 300 + 41 \sqrt{C}$ [pF]
- **Linearity**
 - Linear for pulses up 20 fC
- **Dynamic Range**
 - > 200 fC

These are the specs and numbers from the first SVX4.





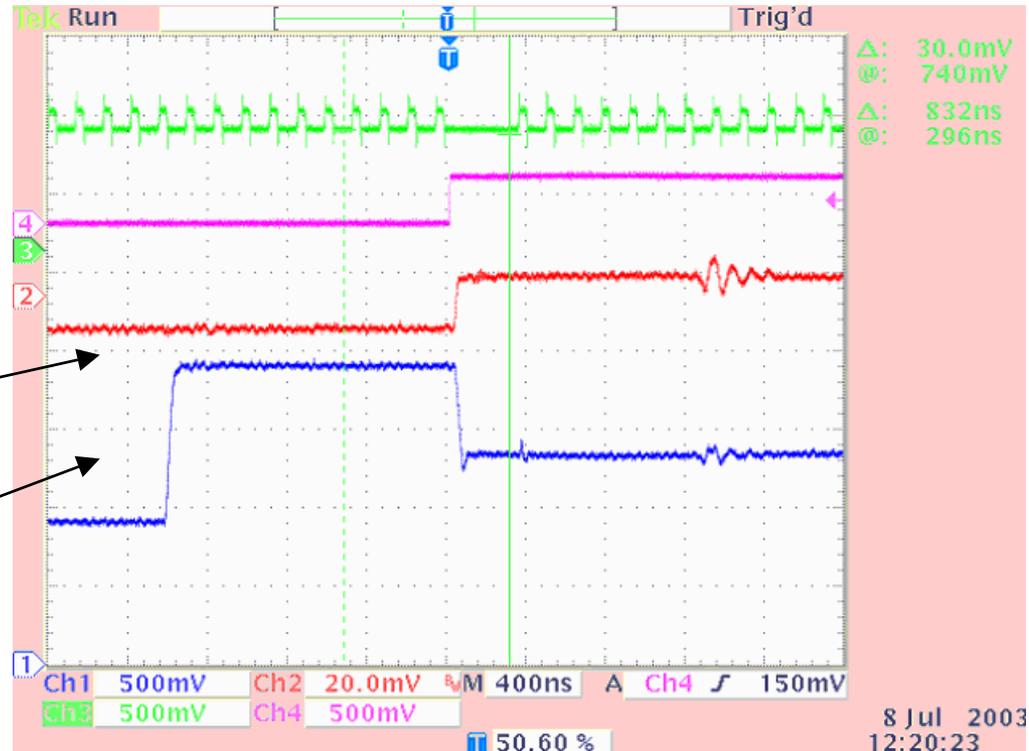
Preamplifier Measurements (cont.)

Front end clock →

Pulser output →

Voltage on capacitor →

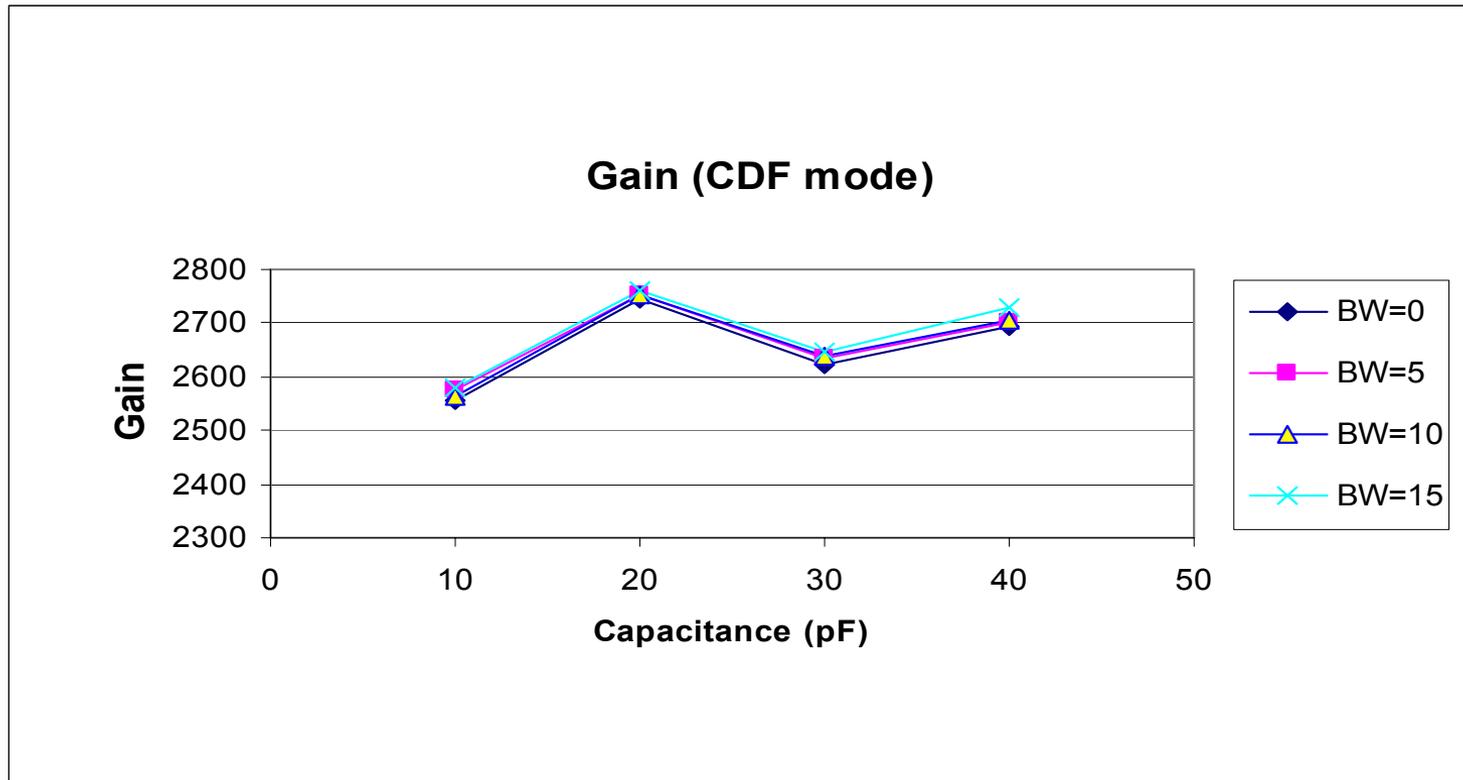
Preamplifier response →
- 1V as it should be
- dynamic range 200 fC



For the bucket we injected charge in we have a clock of 396 ns.
Our previous measurements were made with an unsoldered resistor for channel 127 and was producing the strange behavior.



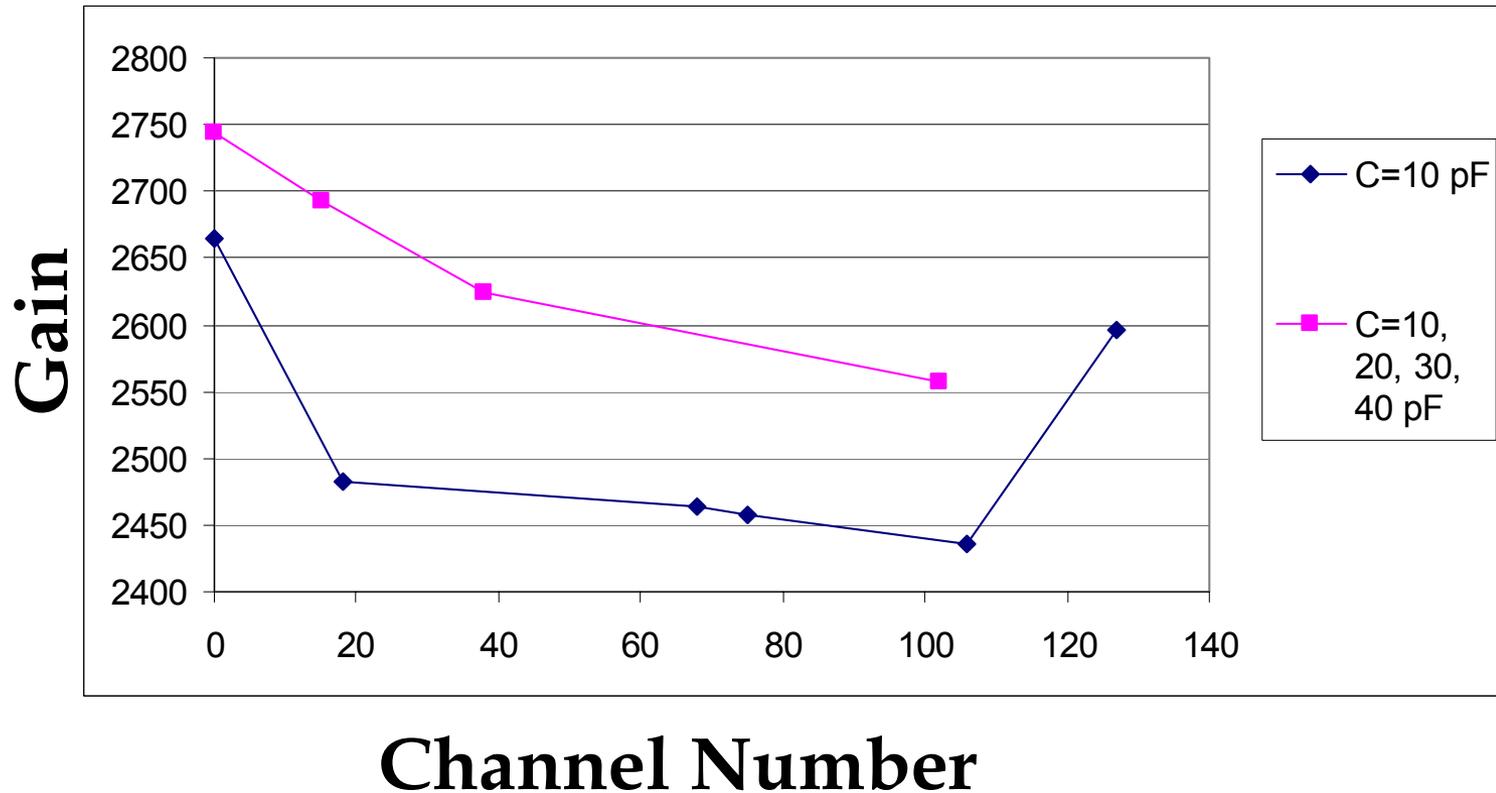
Preamplifier Measurements (cont.)



For 396 ns the gain looks flat, but upon closer Inspection there is a geometry dependent effect!



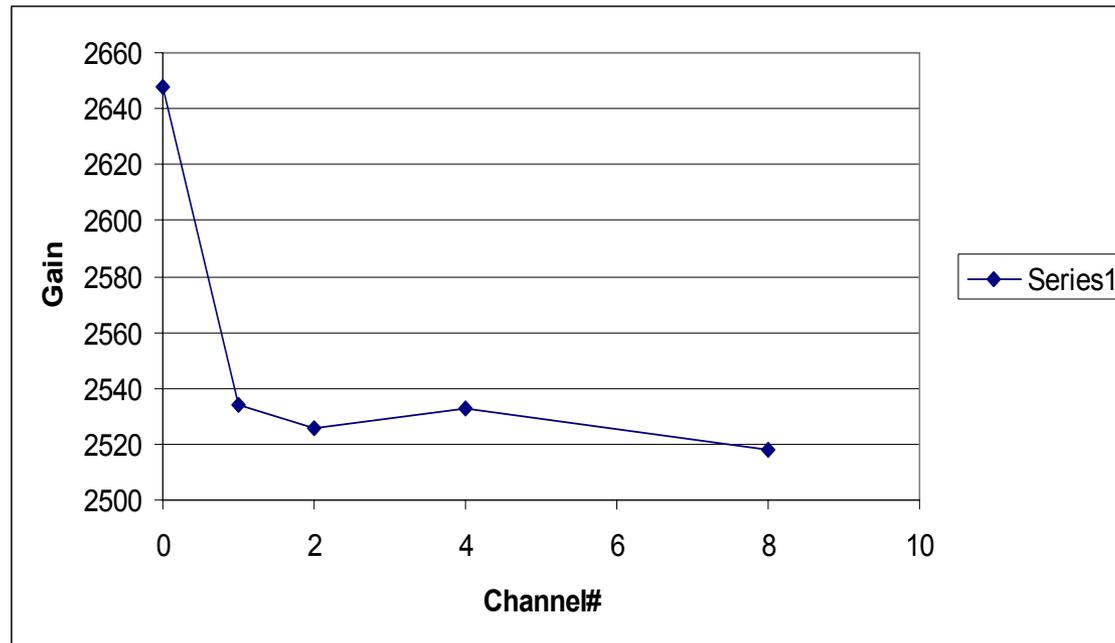
Preamplifier Measurements (cont.)



This is the gain in CDF mode as a function of the channel number. The slope is clearly obvious. The two channels at the end (0 and 128) are edge effects.



Preamplifier Measurement (cont.)

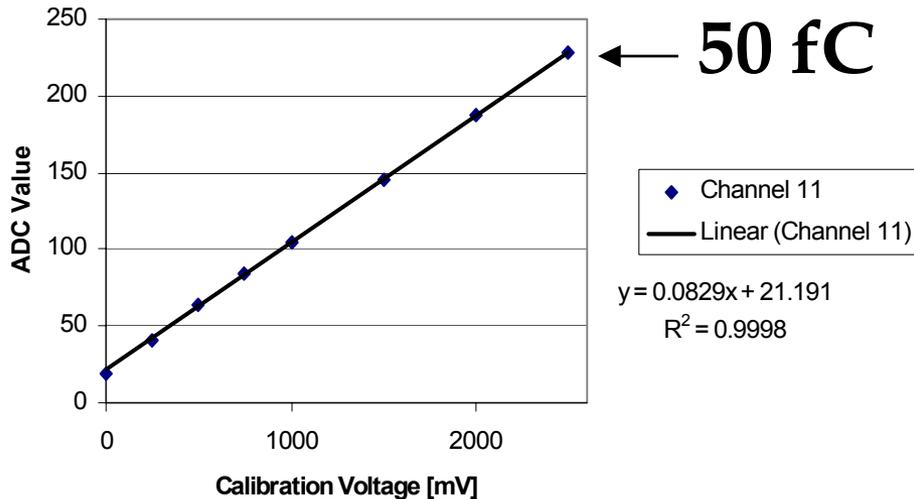


**This is the gain measured at the edge of the chip.
We rewired the chip carrier to investigate
this effect.**

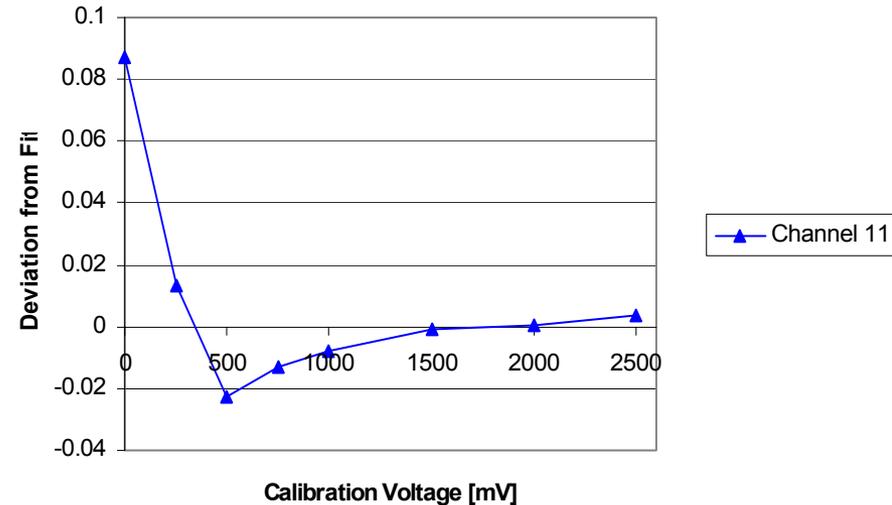


Preamplifier + ADC Measurements

Linearity



Nonlinearity



So the ADC is very linear up to 50 fC which implies the pipeline has a dynamic range of up to 50 fC. Why are the lower values of charge injection giving the greatest deviation from linearity?



Preamplifier + ADC Measurements (cont.)



Normal operating mode

Preamplifier held in reset mode

When operating normally, there is a slight charge injection coming from somewhere. Is it from switching?