

Analysis of the LHC Diamonds SC0

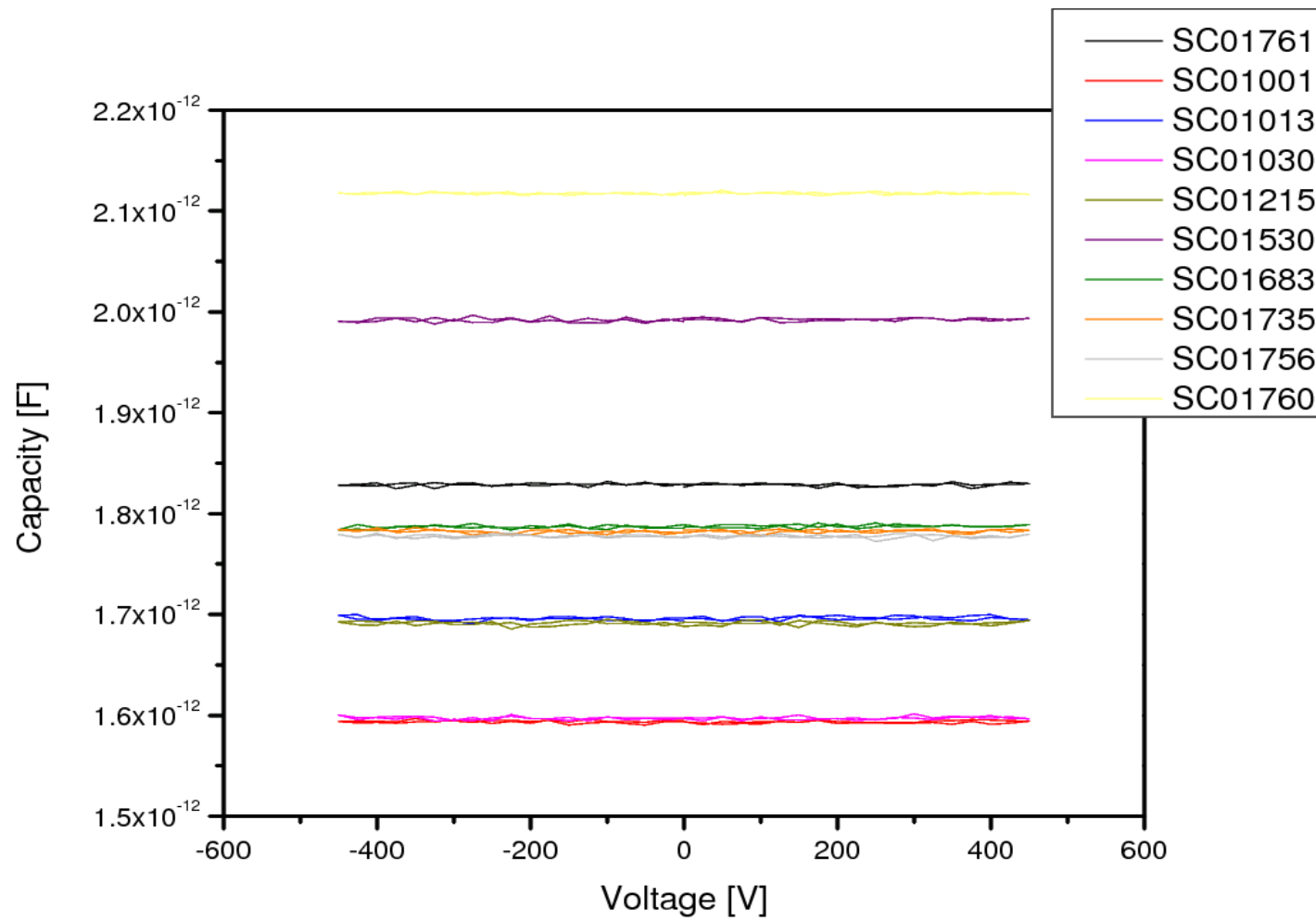
CCE Measurements

Maria Hempel

10 Single Crystal Diamonds

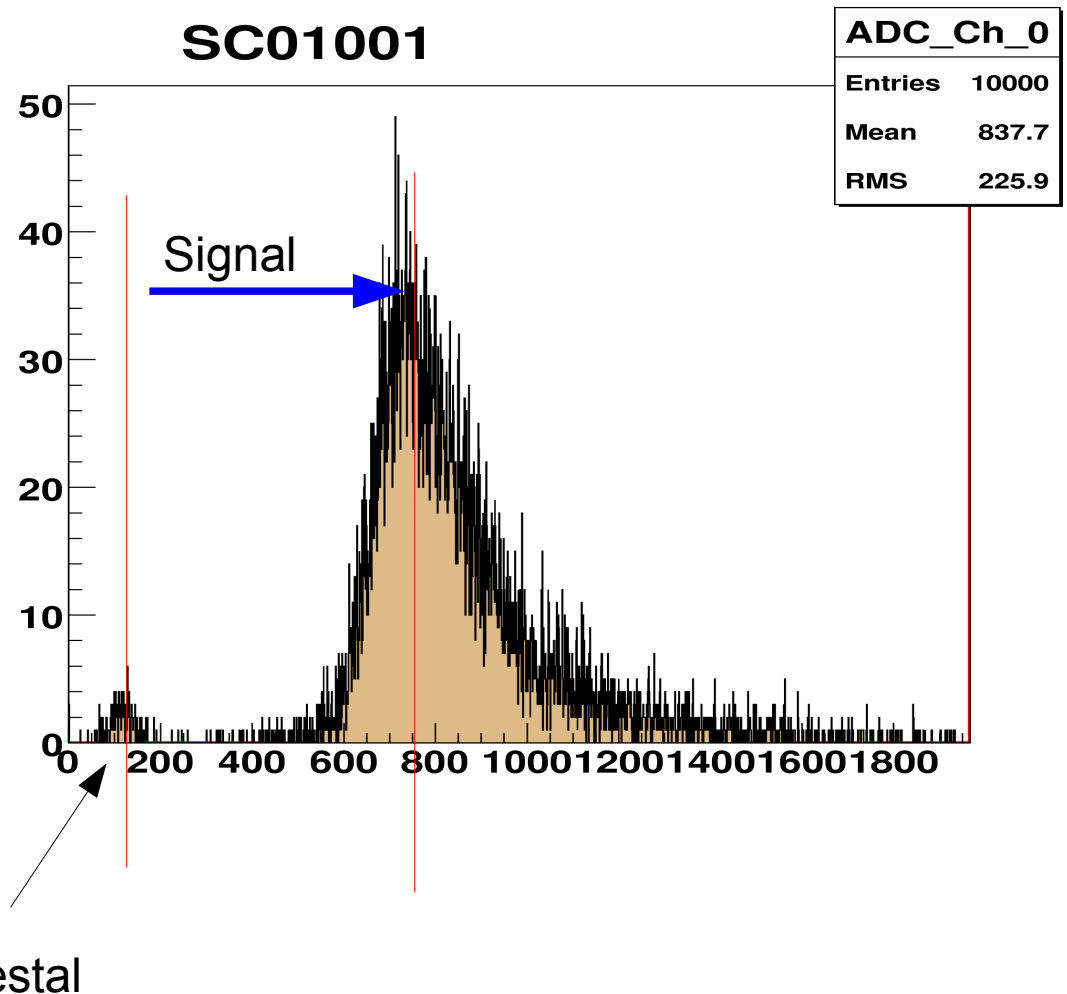
Diamond	Size [mm]	Capacity [pF] (measured)	Comments
SC01001	4.7 x 4.7 x 0.5	1.6	-
SC01013	4.45 x 4.7 x 0.48	1.7	acid
SC01030	4.7 x 4.7 x 0.5	1.6	-
SC01215	4.7 x 4.7 x 0.5	1.7	acid
SC01530	4.7 x 4.7 x 0.5	2	-
SC01683	4.7 x 4.7 x 0.5	1.78	acid
SC01735	4.7 x 4.7 x 0.5	1.78	acid
SC01756	4.7 x 4.7 x 0.5	1.78	acid
SC01760	4.7 x 4.7 x 0.5	2.12	acid
SC01761	4.7 x 4.7 x 0.5	1.83	-

CV Plot



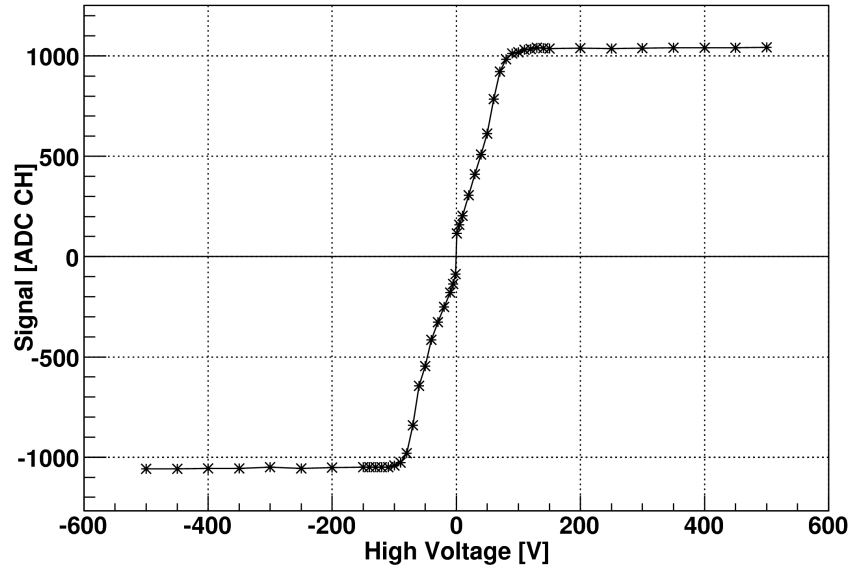
CCE Measurements

- Apply a voltage (-500 V till +500 V) on the diamond
- Measure the ADC spectra
- Get a signal
- Get constant signal after a certain voltage

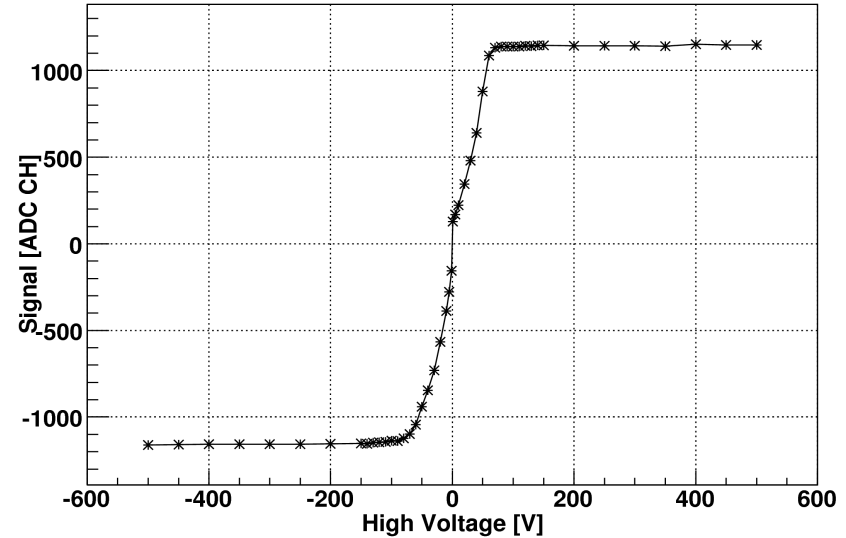


SC01013 & SC01760 & SC01735

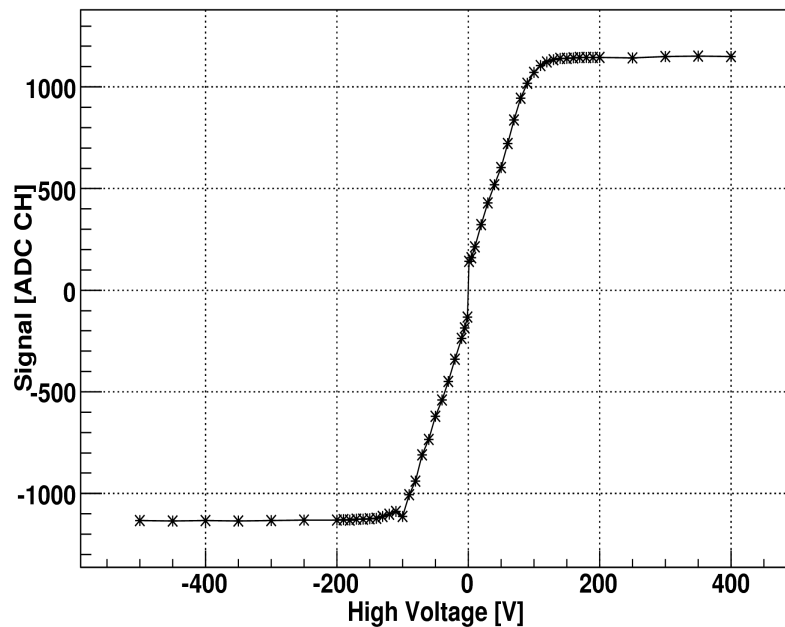
Signal vs Voltage SC01013



Signal vs Voltage SC01735



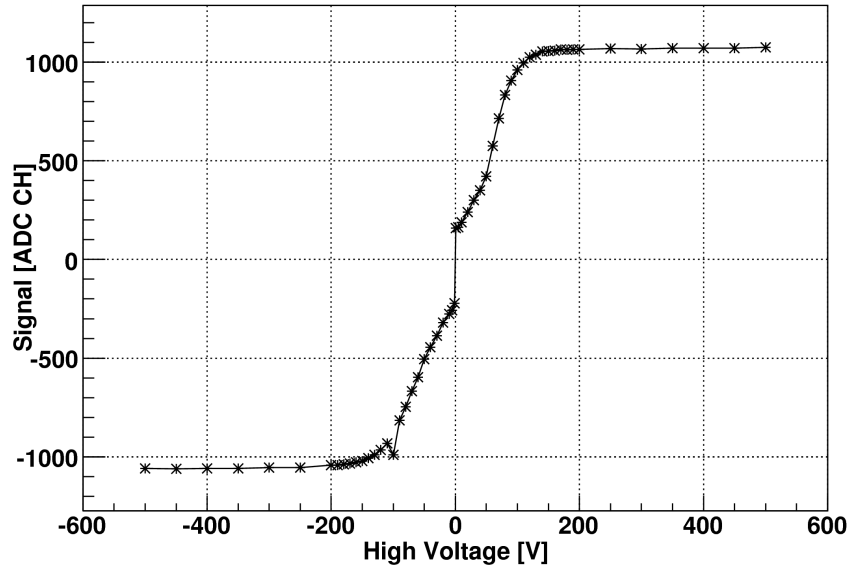
Signal vs Voltage SC01760



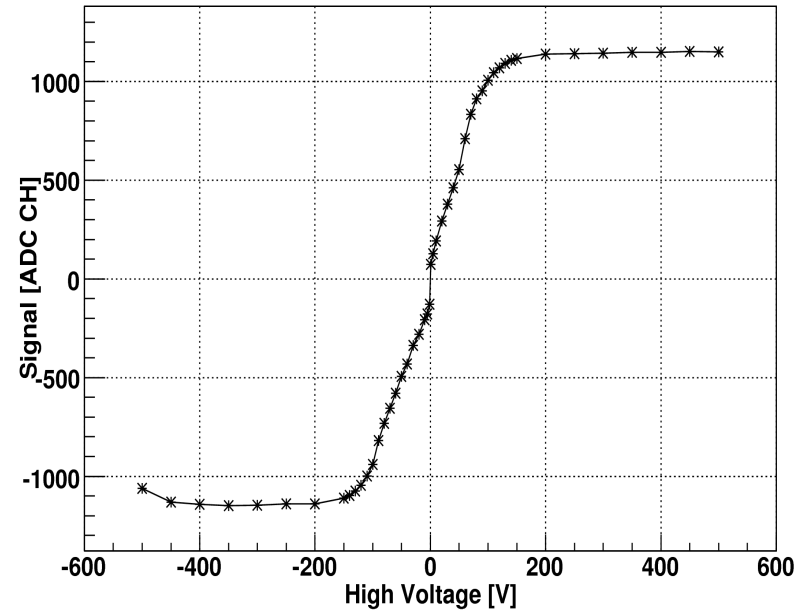
- Plots are fine
- Constant Signal after 150V

SC01761 & SC01215 & SC01530

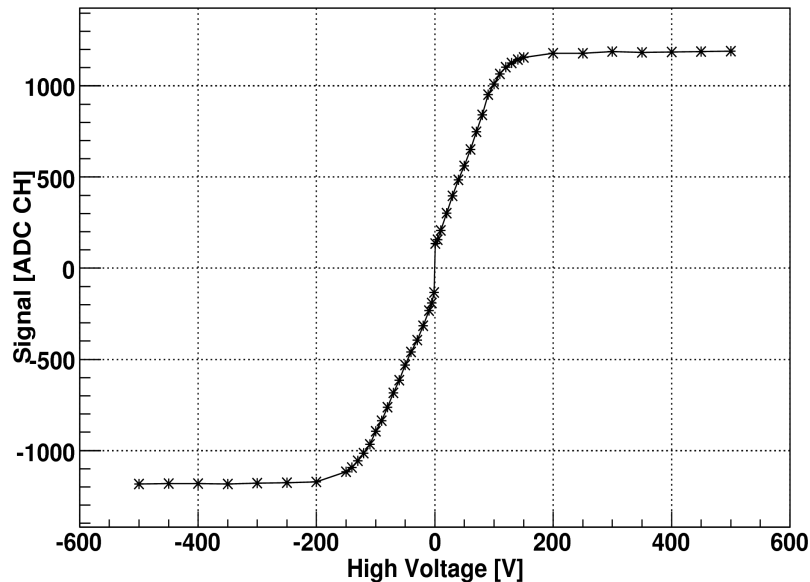
Signal vs Voltage SC01215



Signal vs Voltage SC01530



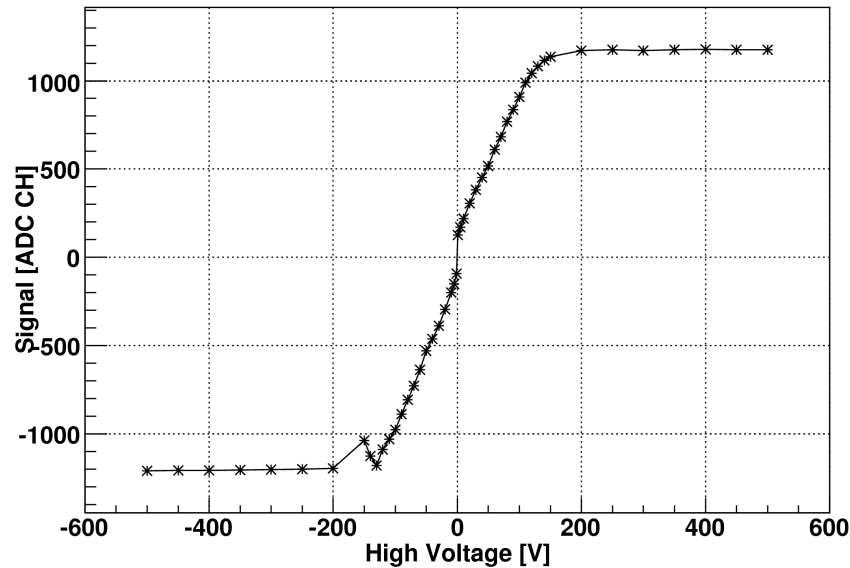
Signal vs Voltage SC01761



- Plots are fine
- Constant signal after ~200V

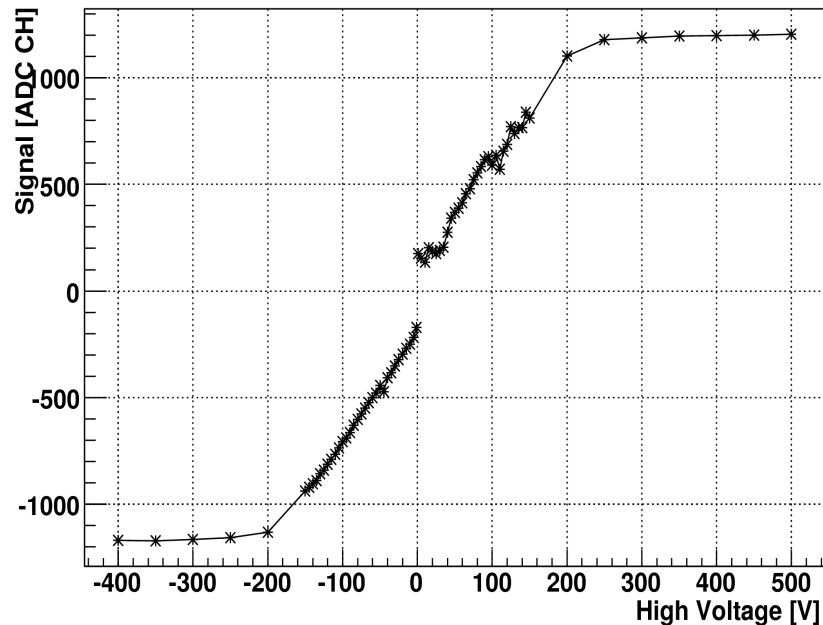
SC01756 & SC01683

Signal vs Voltage SC01756



- Constant Signal after 200V
- Unusual peak between 150V and 200V
- Constant after 200V

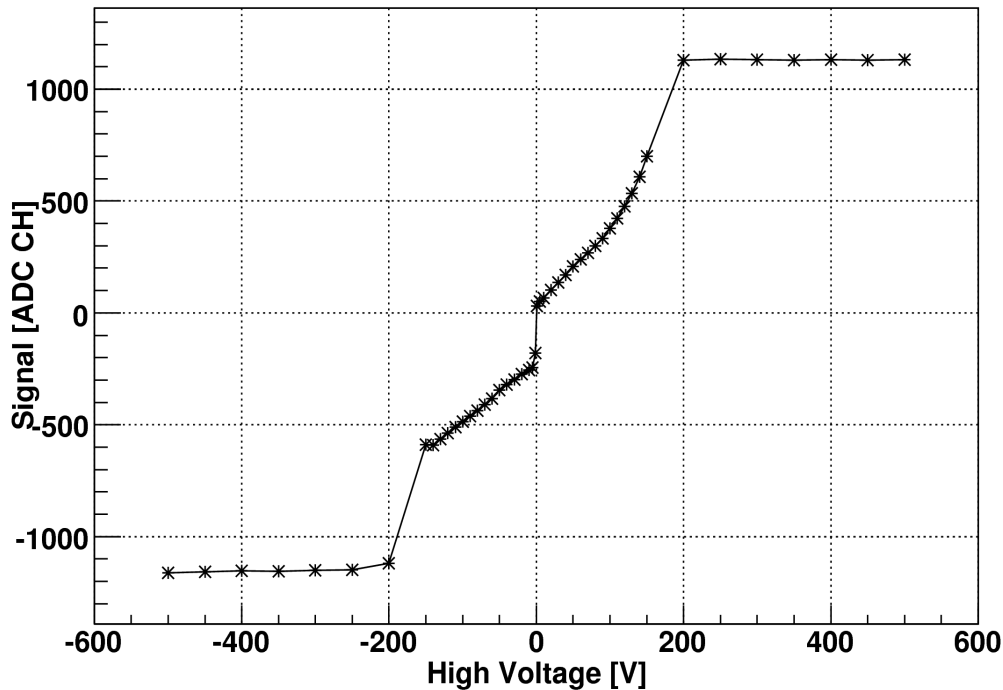
Signal vs Voltage SC01683



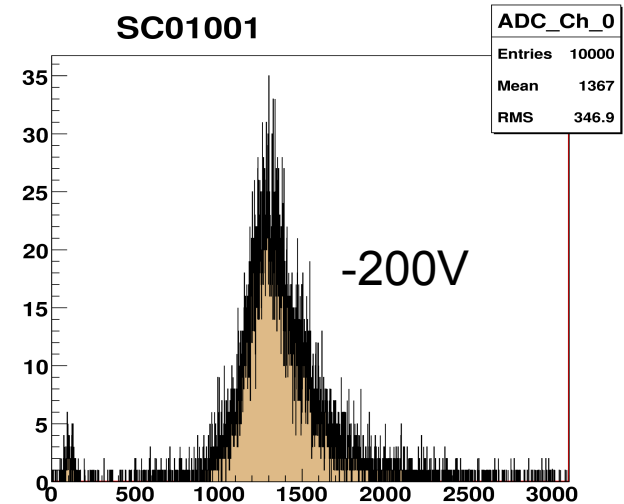
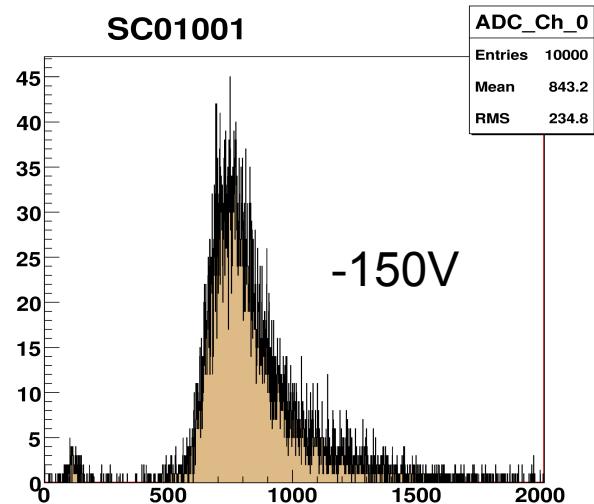
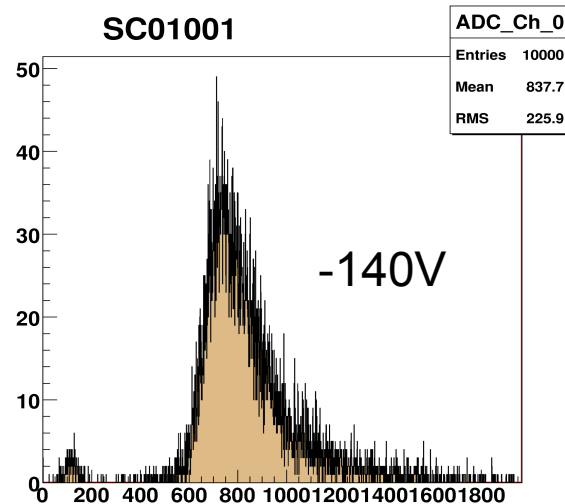
- Polarization effect at positive Voltage
- Constant after 200V

SC01001

Signal vs Voltage SC01001

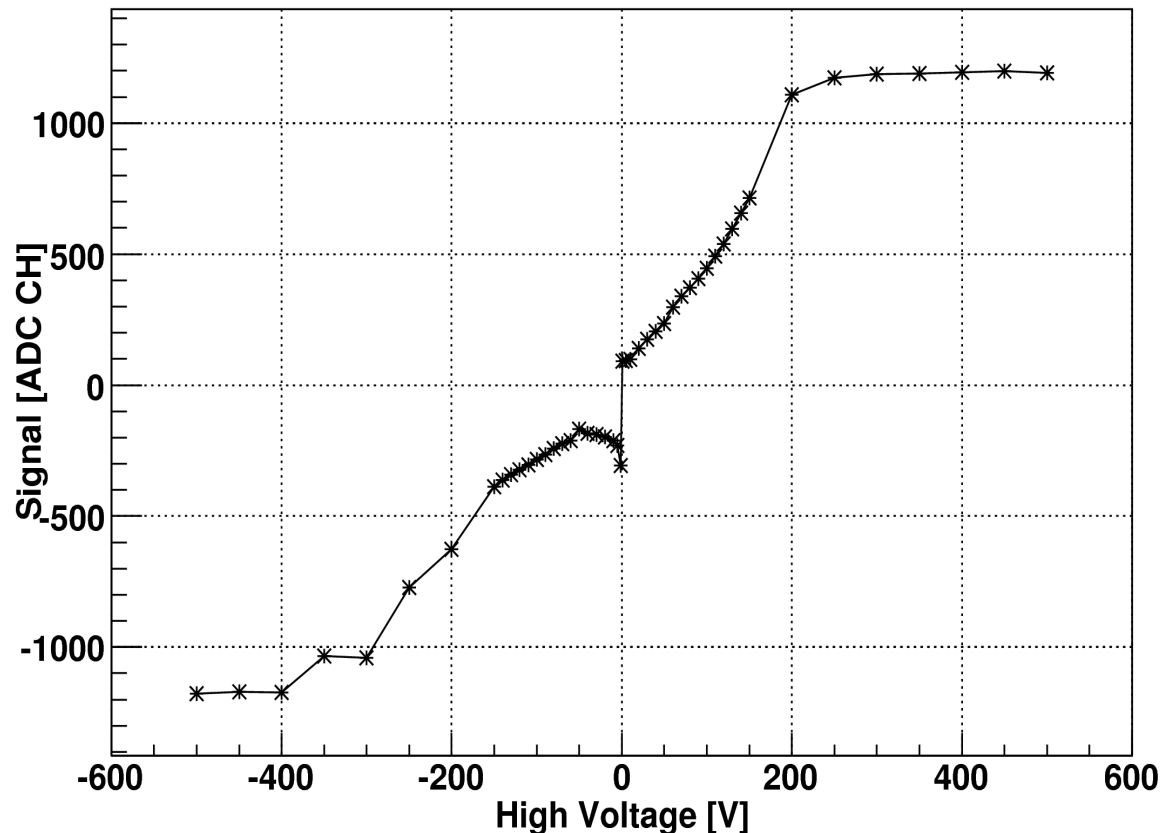


- Not as expected
- Jump at -150V and +150
- No ADC spectra between -150V and -200V
- But constant after 200V



SC01030

Signal vs Voltage SC01030



- Not an ideal curve
- For positive voltage constant after 200V
- For negative voltage no constant value

Conclusion

Diamond	Comment	Voltage (constant signal)
SC01001	No ideal curve	200 V
SC01013	Fine	150 V
SC01030	No ideal curve	—
SC01215	Fine	200 V
SC01530	Fine	200 V
SC01683	Polarization effects	200 V
SC01735	Fine	150 V
SC01756	Fine	200 V
SC01760	Fine	150 V
SC01761	Fine	200 V