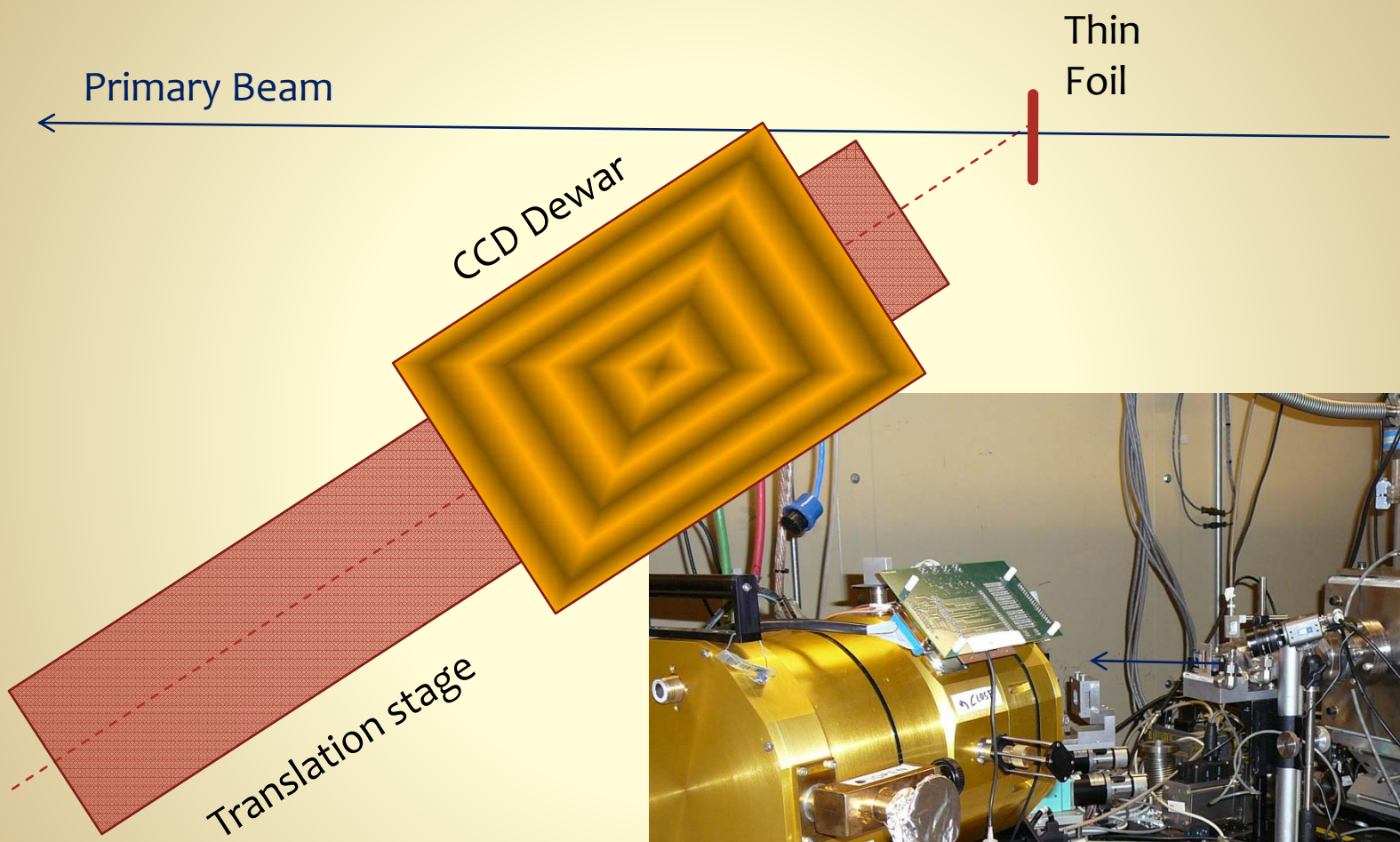
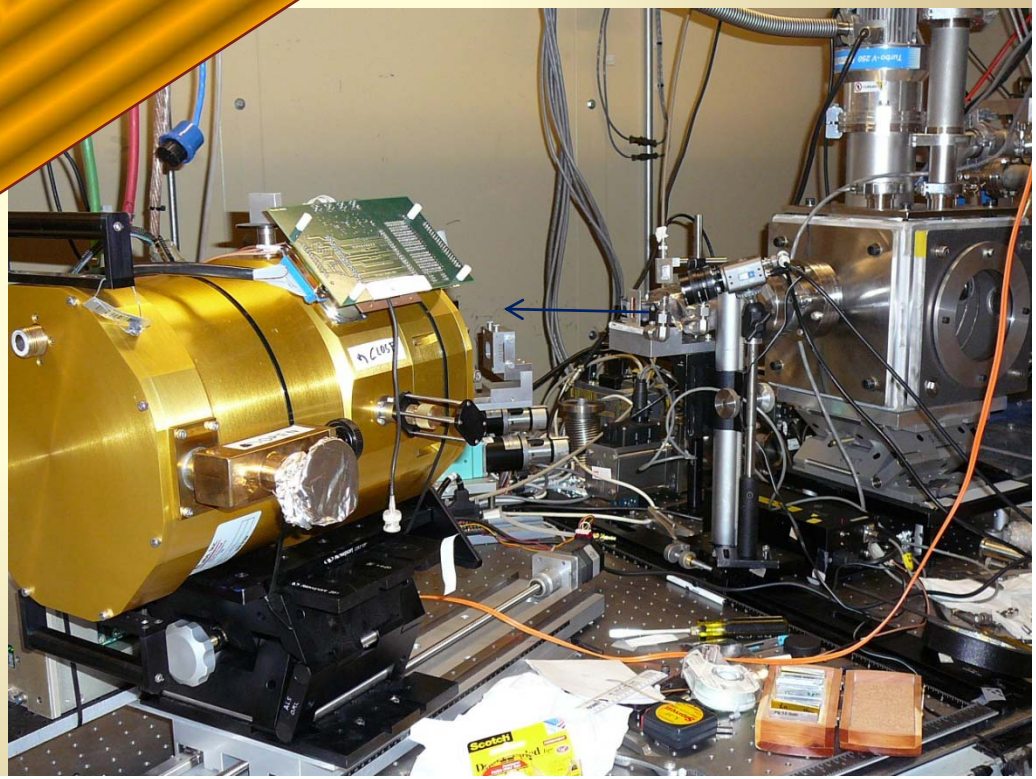
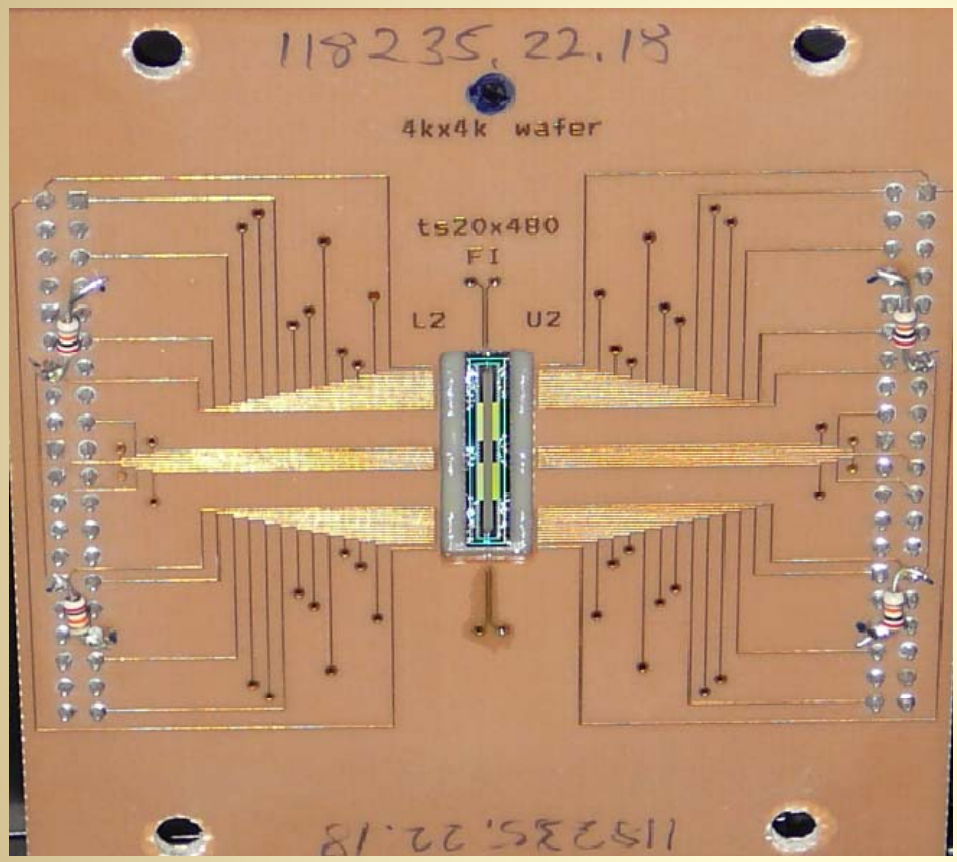
CCD Cuisine (on 5.3.1) – May '08

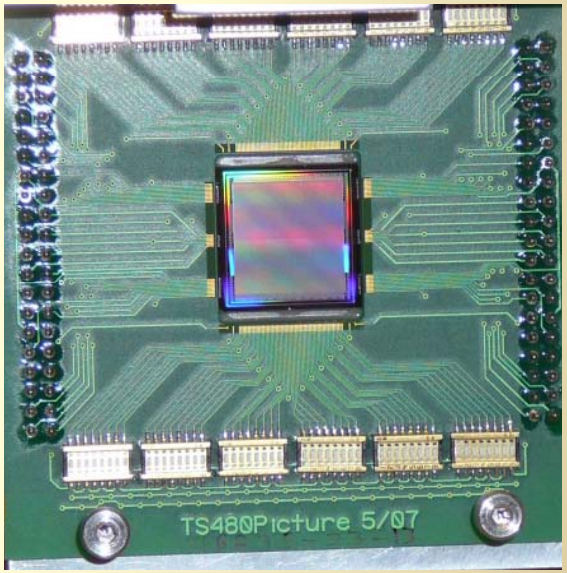




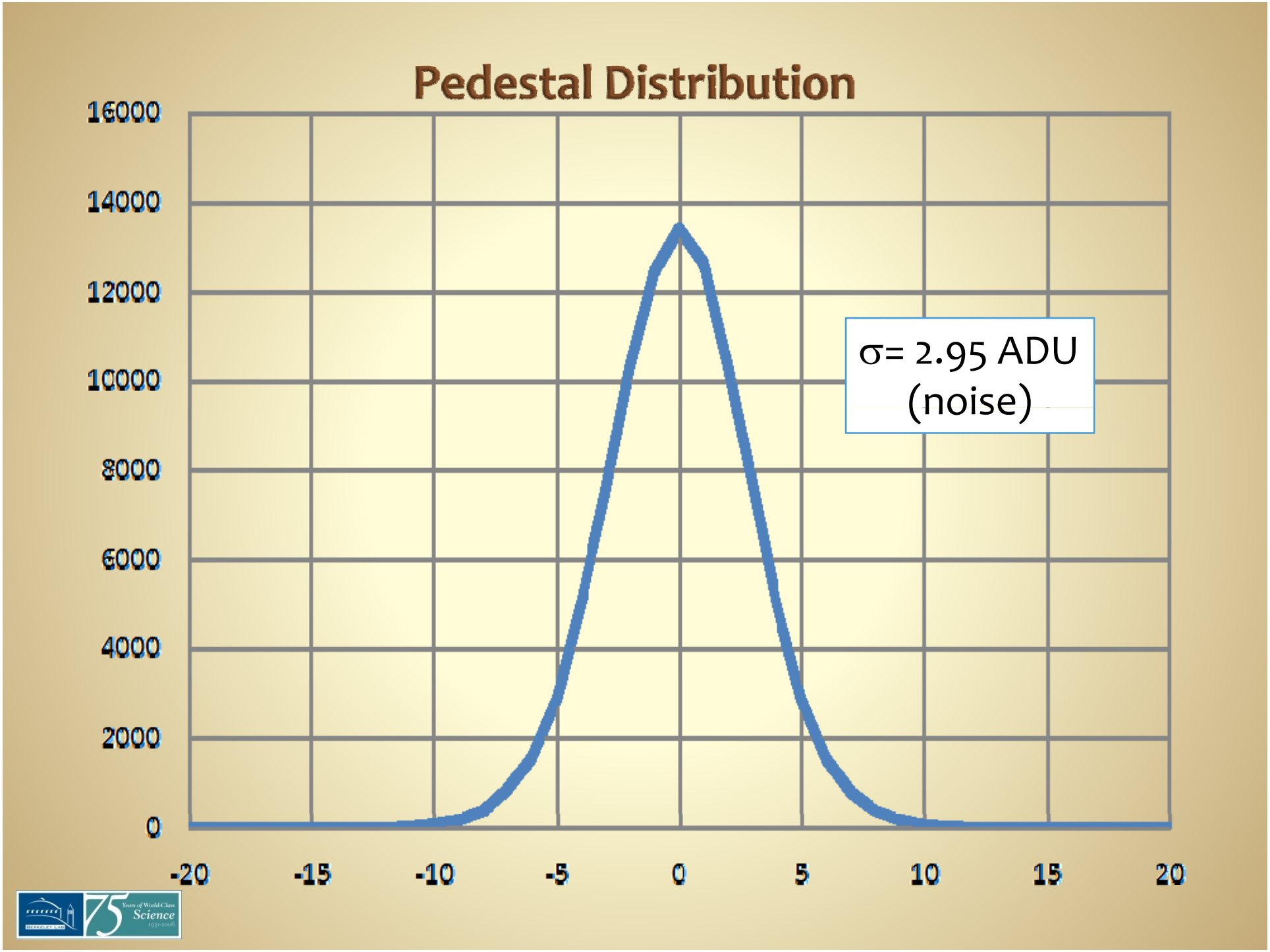
20 x 480 version of FCCD



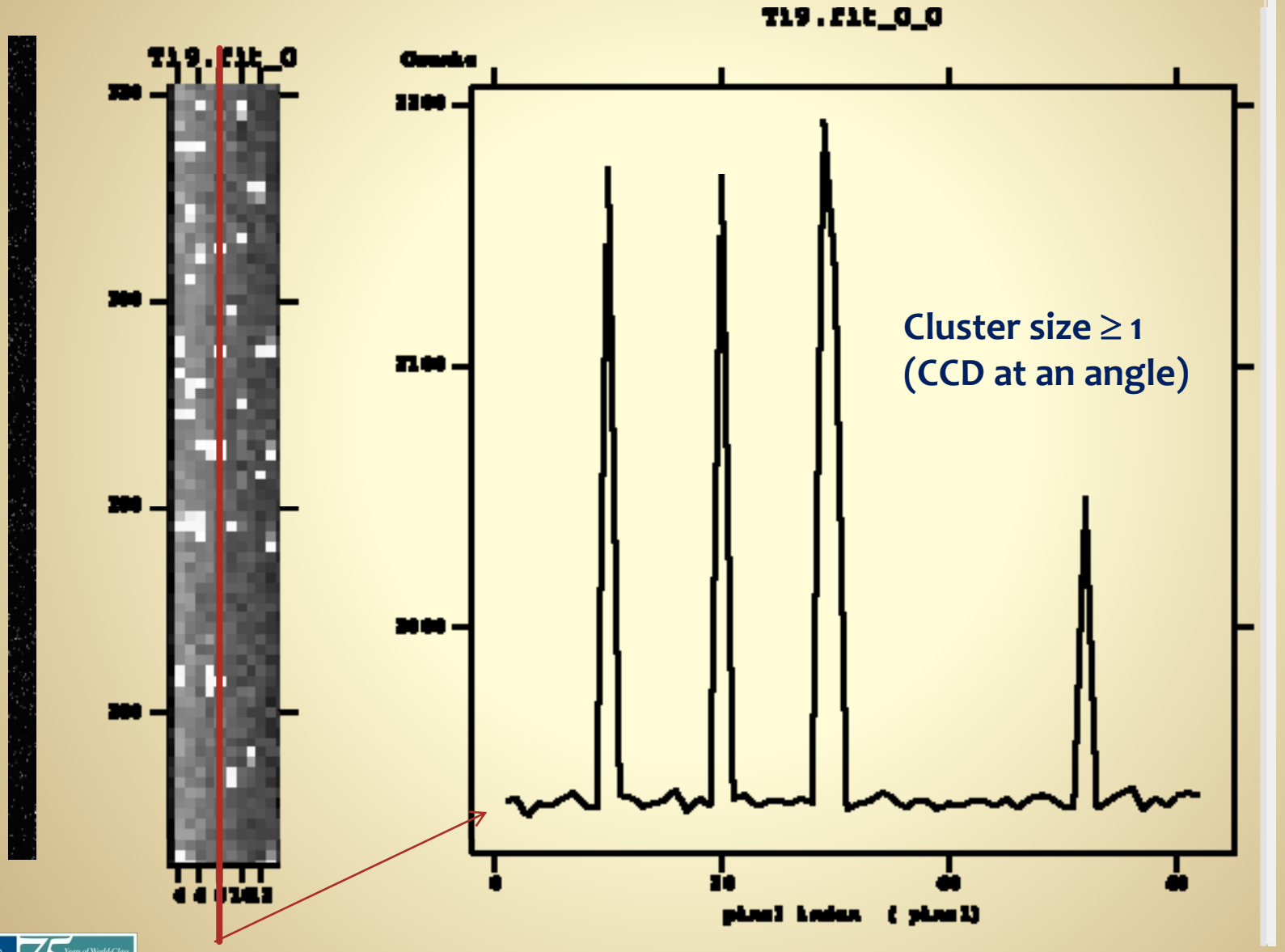
20 x 480 (= 4 x 10 x 240)



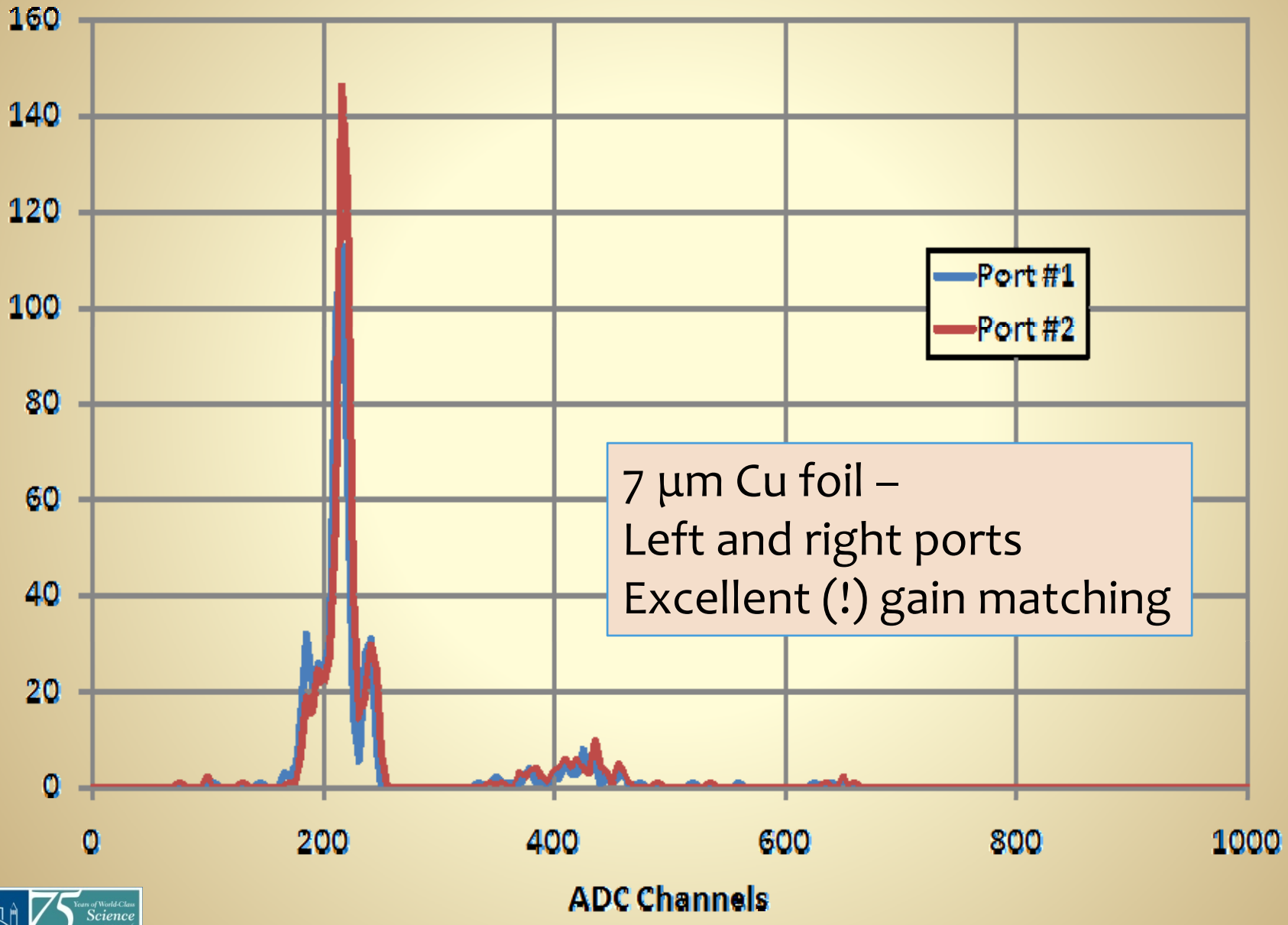
96-port FCCD


Pedestal Distribution
16000
14000
12000
10000
8000
6000
4000
2000
0
-20
-15
-10
-5
0
5
10
15
20
σ= 2.95 ADU
(noise)

Single x-rays

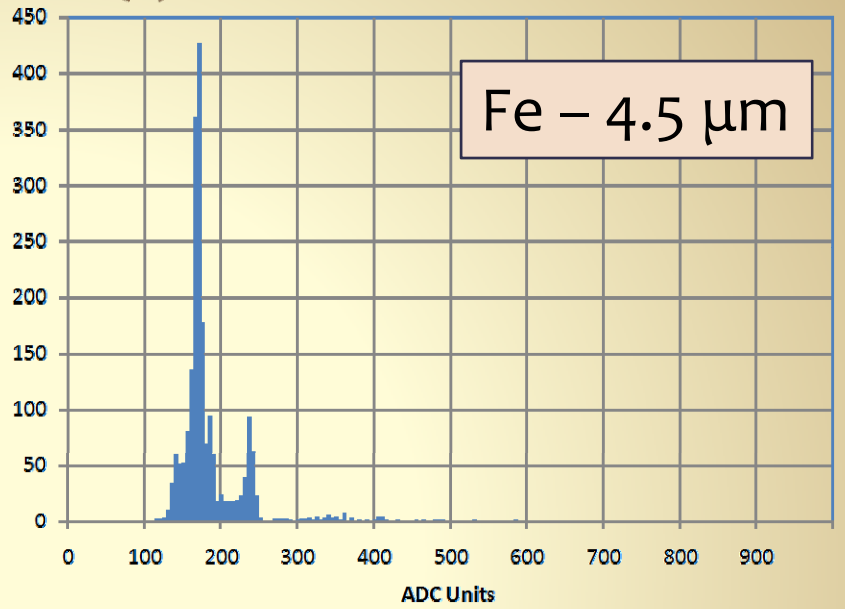


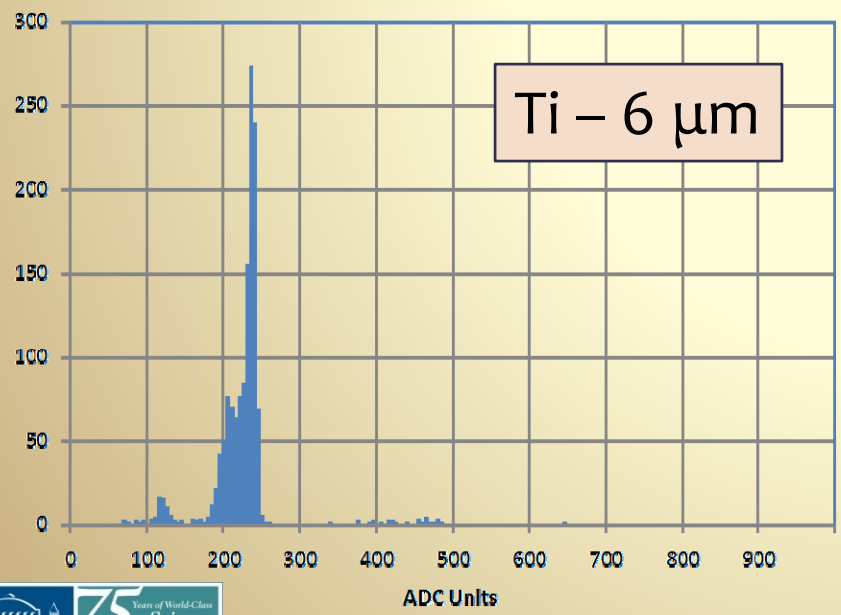
Read out as 2-port device

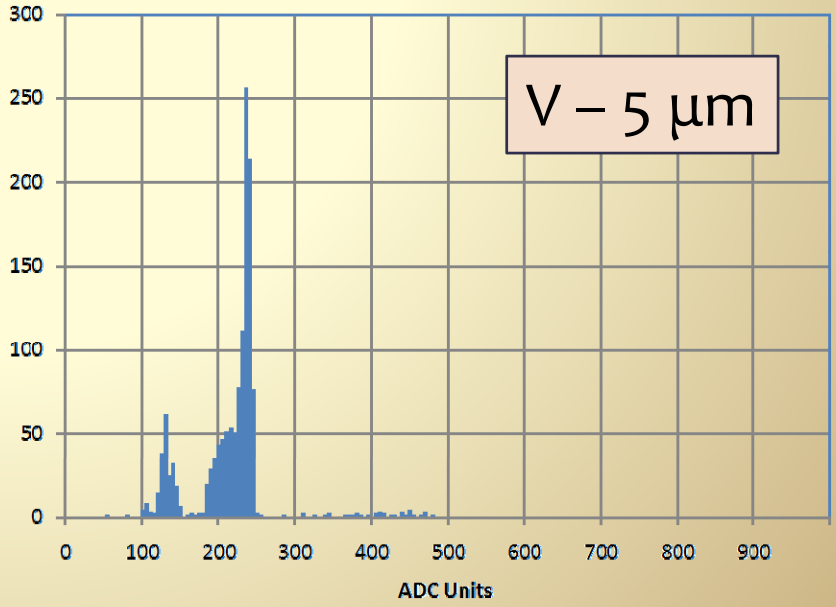


Spectra (I)

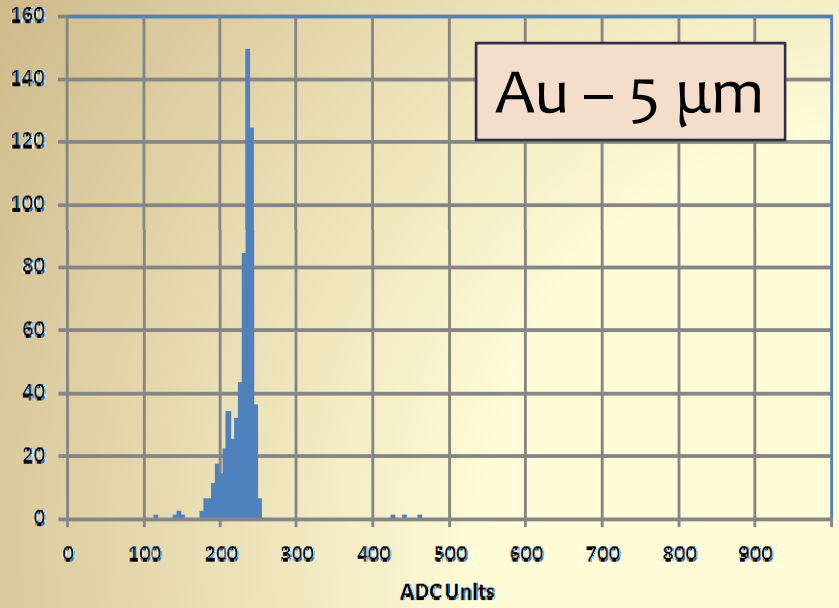
Algorithm: plot central pixel when central / Σ9 >80%
Pedestal subtracted
T_{CCD} = -90 C
1 sec. exposure
126 kHz readout

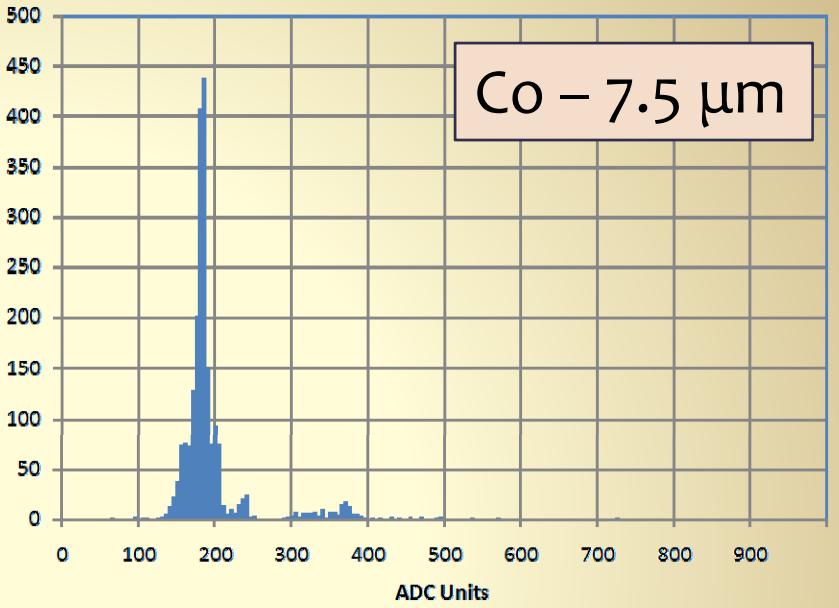


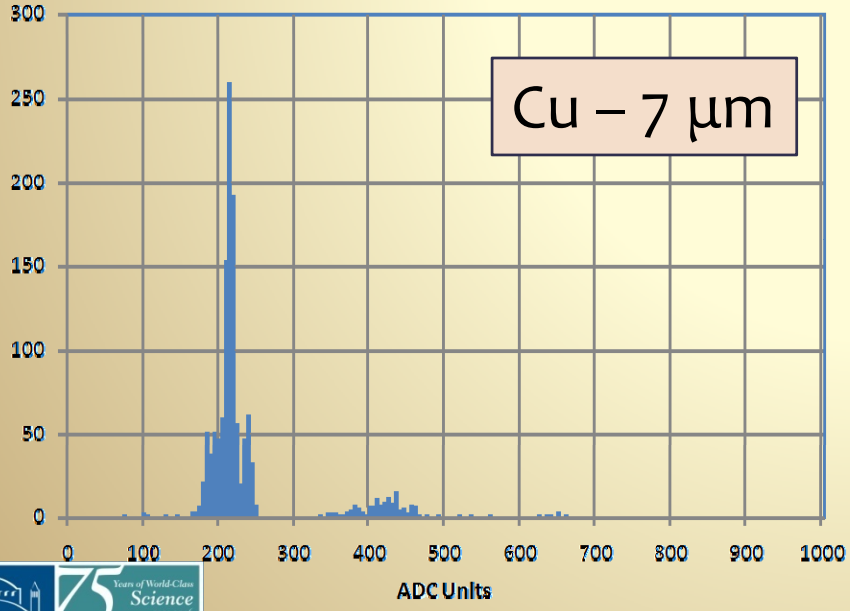


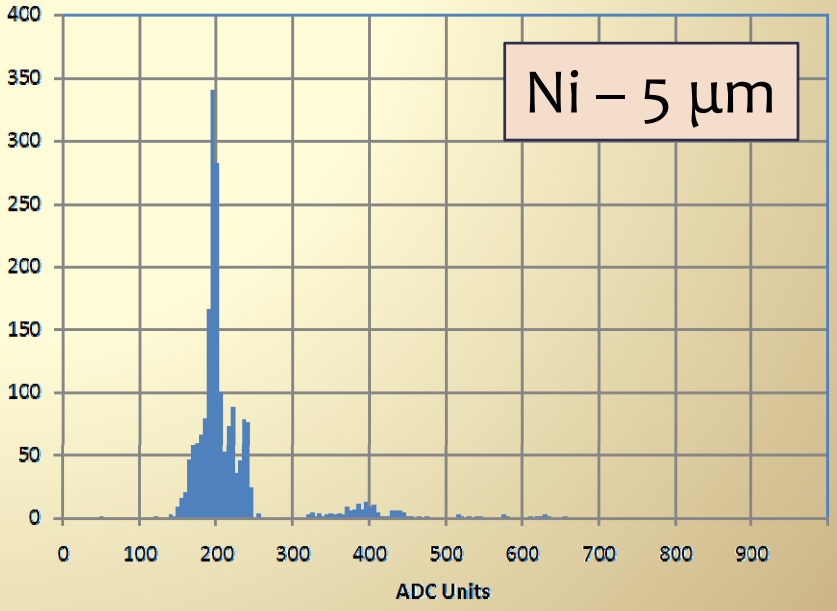


Spectra (II)

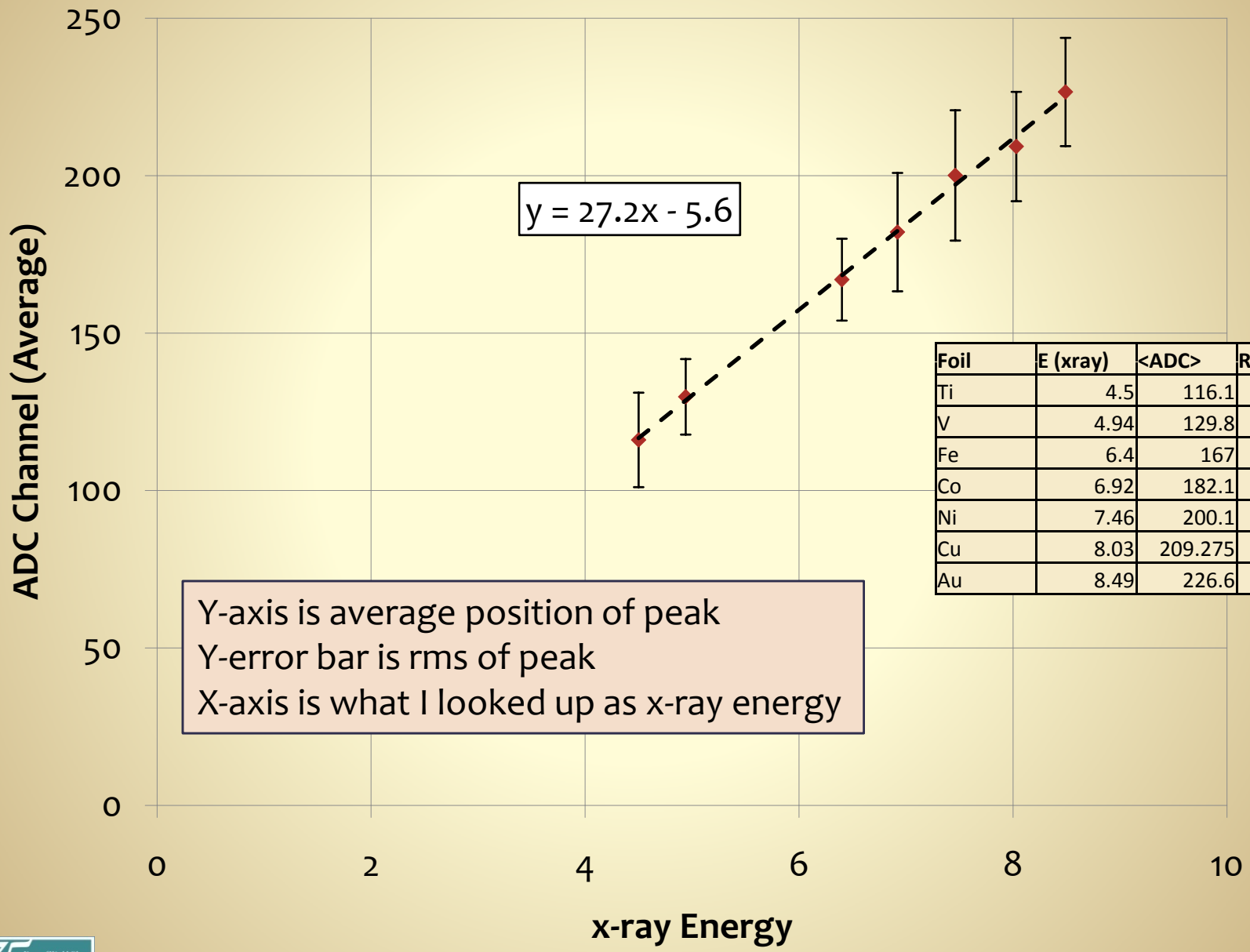

Au – 5 µm
ADC Units


Co – 7.5 µm
ADC Units


Cu – 7 µm
ADC Units


Ni – 5 µm
ADC Units

Calibration



Foil	E (xray)	<ADC>	RMS
Ti	4.5	116.1	15
V	4.94	129.8	12
Fe	6.4	167	13
Co	6.92	182.1	18.8
Ni	7.46	200.1	20.7
Cu	8.03	209.275	17.37
Au	8.49	226.6	17.2

Y-axis is average position of peak
Y-error bar is rms of peak
X-axis is what I looked up as x-ray energy

Conclusions

- Si can be used as a particle detector!
  - And the flux ~ $1/r^2$
  - Start writing the publication!
- Noise too big
  - σ ~ 3 ADU with 27 ADU / kV → 100 eV. At this speed, should be more like 10
  - Light leaks? Control wafer (= no backside processing) – leaky?
  - Measure noise in lab
    - In the dark
    - As a function of temperature
- Next time, for back-illuminated device, obtain higher V_{BIAS}, and perhaps try at smaller angle