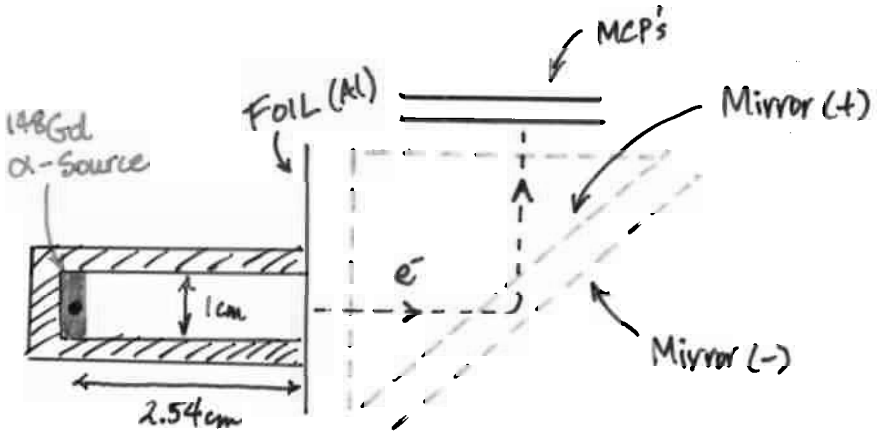
MCP Tests

- Problem from last beam time: fixed – switched bias cables for accelerating and mirror grids

- New tests: geometry – ^{148}Gd alpha-source (16μCi, $T_{1/2}$ = 74.6 years) through Al foil; estimated strength ~ 5000-6000 cts/sec (in 2 minutes: 680000 counts approx.)



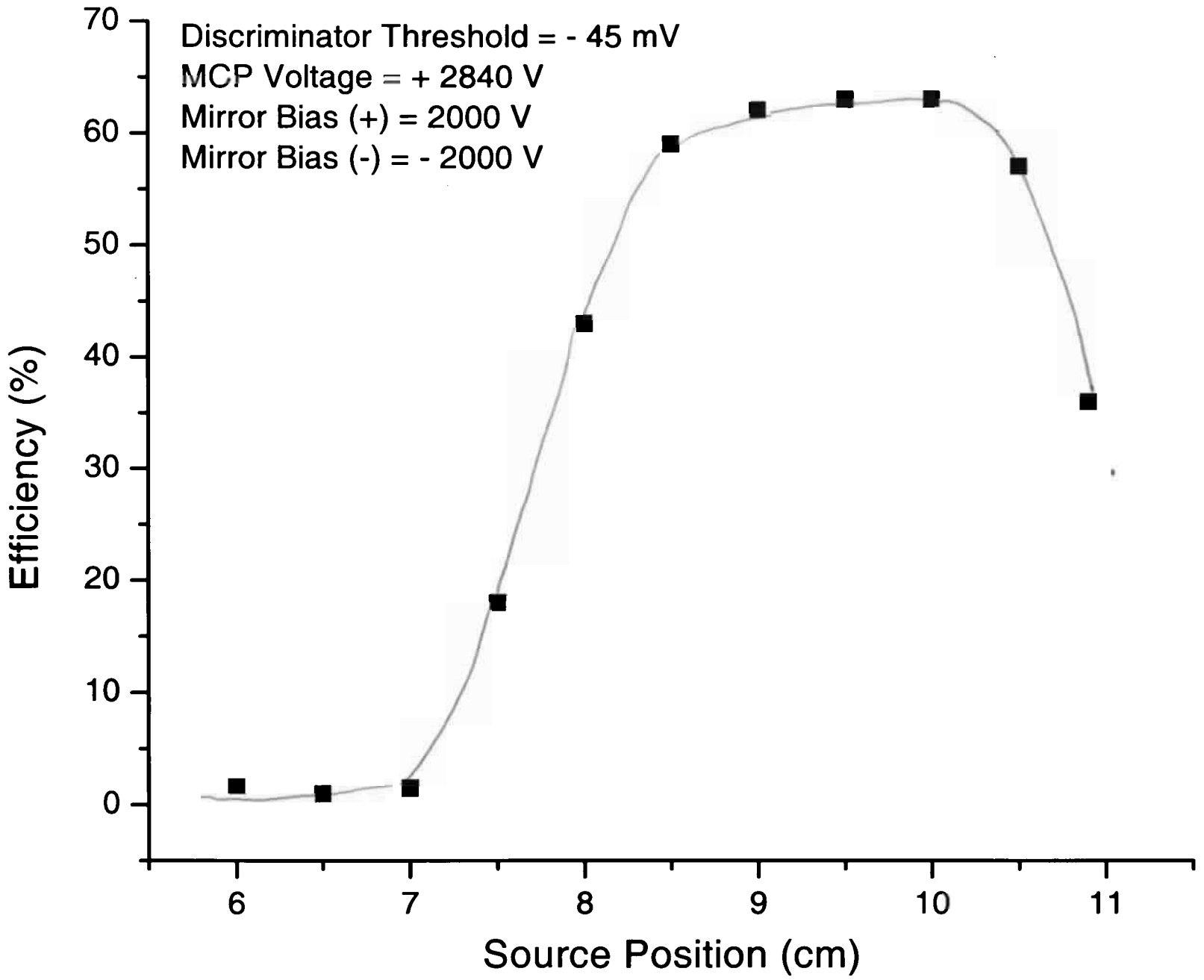
- Optimized mirror biases for best efficiency: +2200V and –2200V, V(+) – V(-) = 4400V maximum.

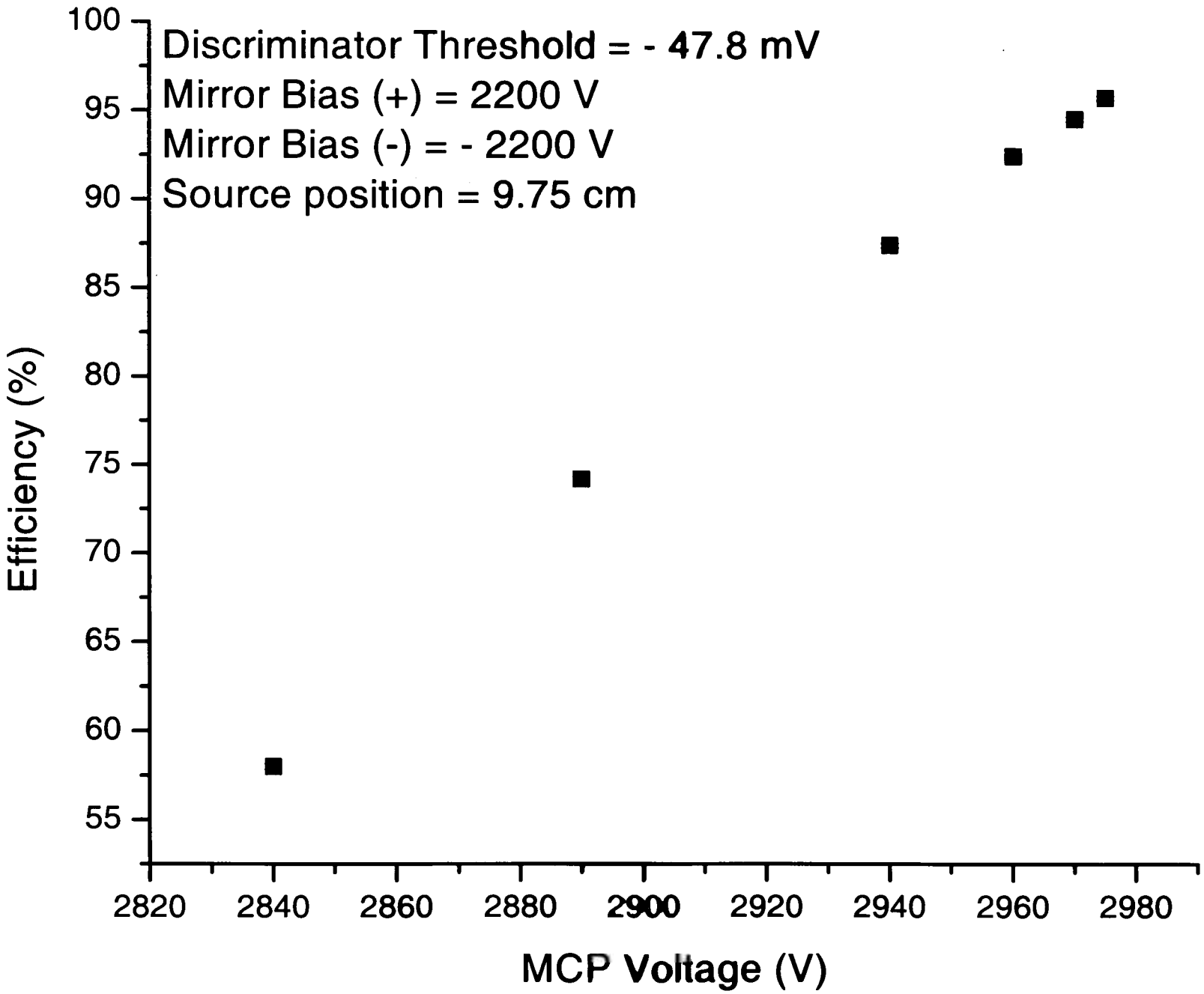
- Measured efficiency vs. MCP bias

- MCP tripped at + 2975 V; since the trip, noise rates have been higher due to poorer signal-to-noise ratio; we can cut it back down by raising the discriminator threshold at the expense of efficiency

- Observed signals from the resistive anode (used for position measurements)

- NEXT: integrate MCP into the DAQ


Discriminator Threshold = - 45 mV
MCP Voltage = + 2840 V
Mirror Bias (+) = 2000 V
Mirror Bias (-) = - 2000 V
Efficiency (%)
70
60
50
40
30
20
10
0
6
7
8
9
10
11
Source Position (cm)


Discriminator Threshold = - 47.8 mV
Mirror Bias (+) = 2200 V
Mirror Bias (-) = - 2200 V
Source position = 9.75 cm
Efficiency (%)
100
95
90
85
80
75
70
65
60
55
2820
2840
2860
2880
2900
2920
2940
2960
2980
MCP Voltage (V)