

# Initial Analysis of GEM: First Semester Results

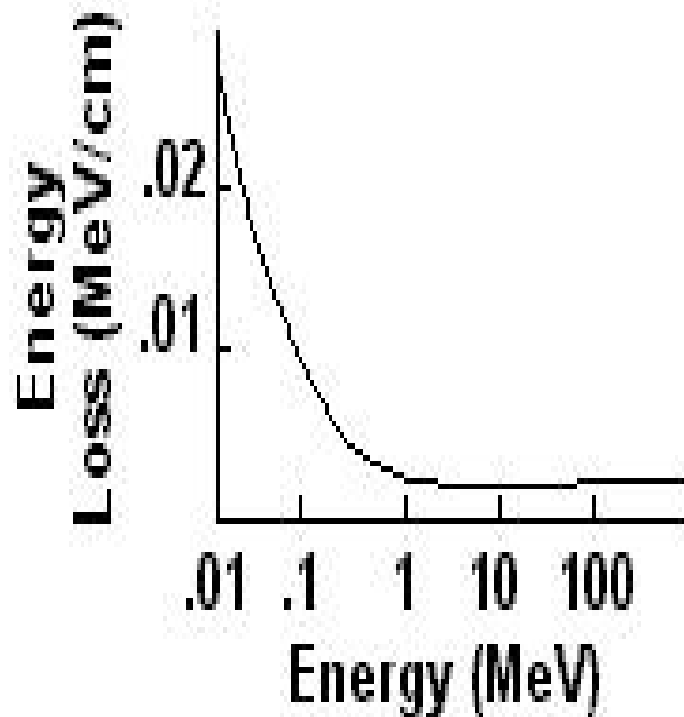
By David Jenkins

January 11, 2005

# Data Runs

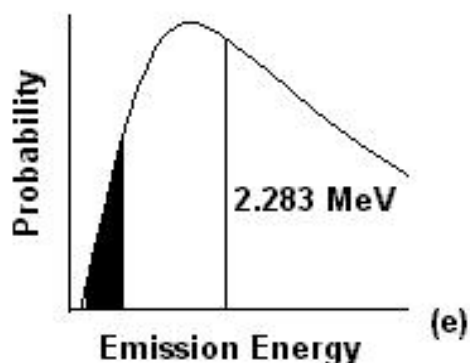
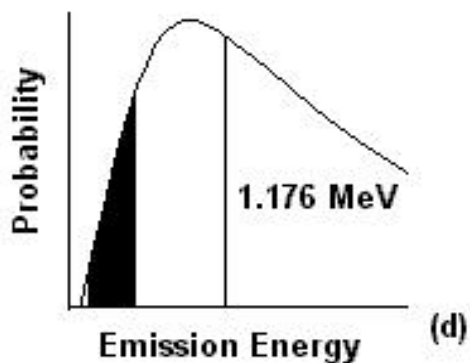
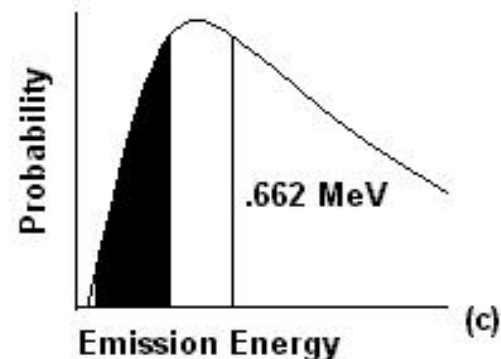
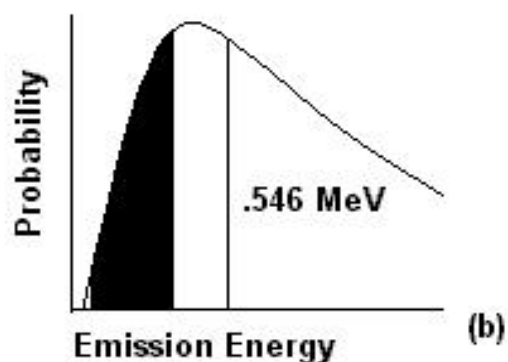
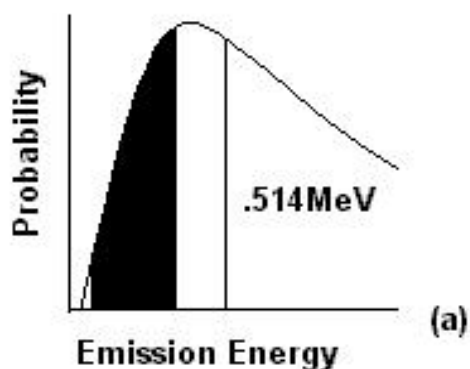
- Two different sources
  - Cs-137
    - 0.514 MeV e- + 0.662 MeV ph (79.9%)
    - 0.514 MeV e- (14.1%)
    - 1.176 MeV e- (6%)
  - Sr-90
    - 0.546 MeV e- (100%)
    - Y-90 2.283 MeV e- (100%)
- Three different Ar:CO<sub>2</sub> mixtures
  - 70:30 (w/ Cs-137 and to be done with Sr-90)
  - 80:20 (w/ Cs-137 and to be done with Sr-90)
  - 85:15 (w/ Cs-137 and Sr-90)

# Background Information



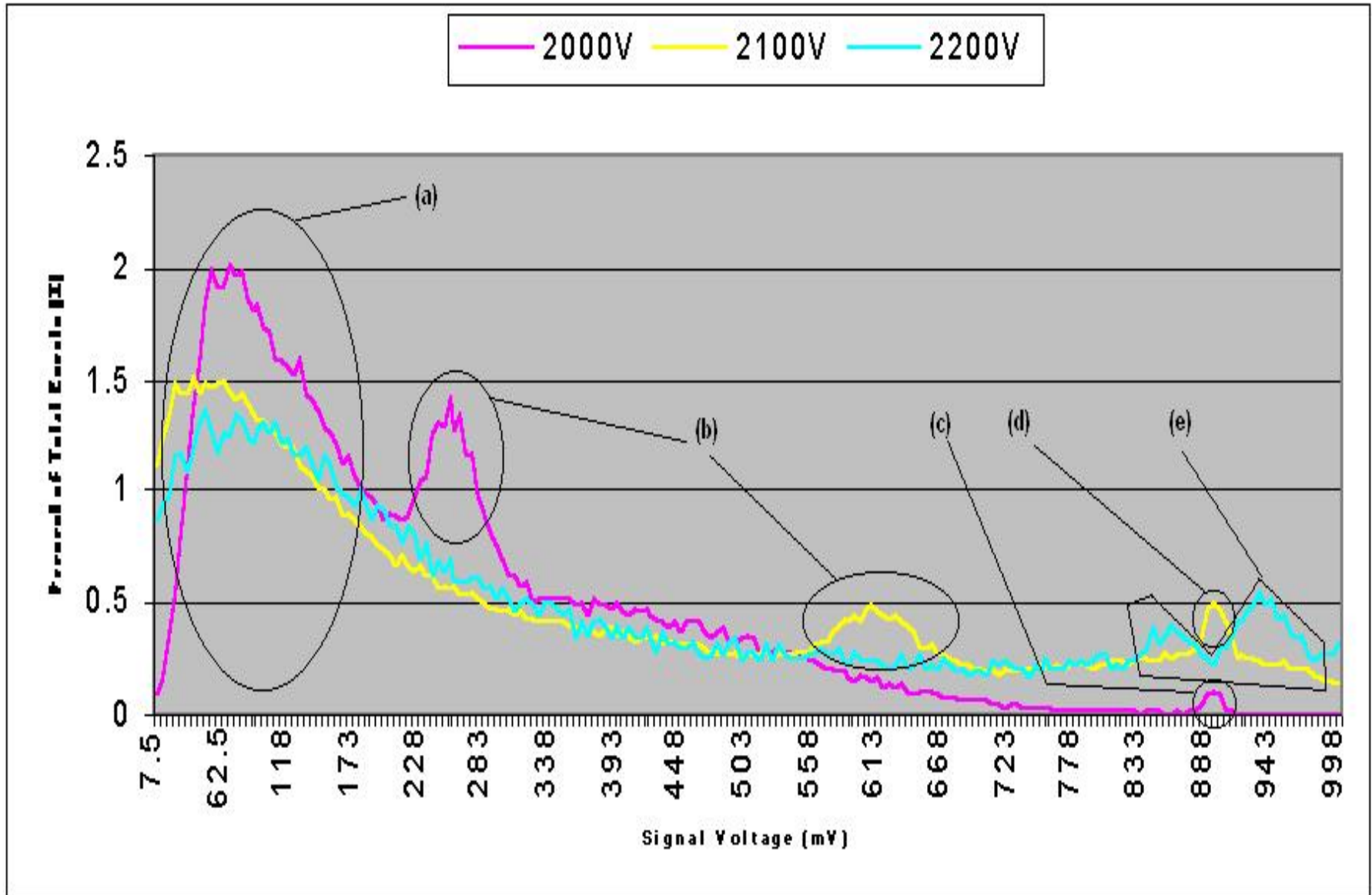
- From about 0.6MeV and above energy loss is about the same  $\sim 2$  keV
- This has interesting consequences as to which emissions are detected

# Emissions Most Likely Detected

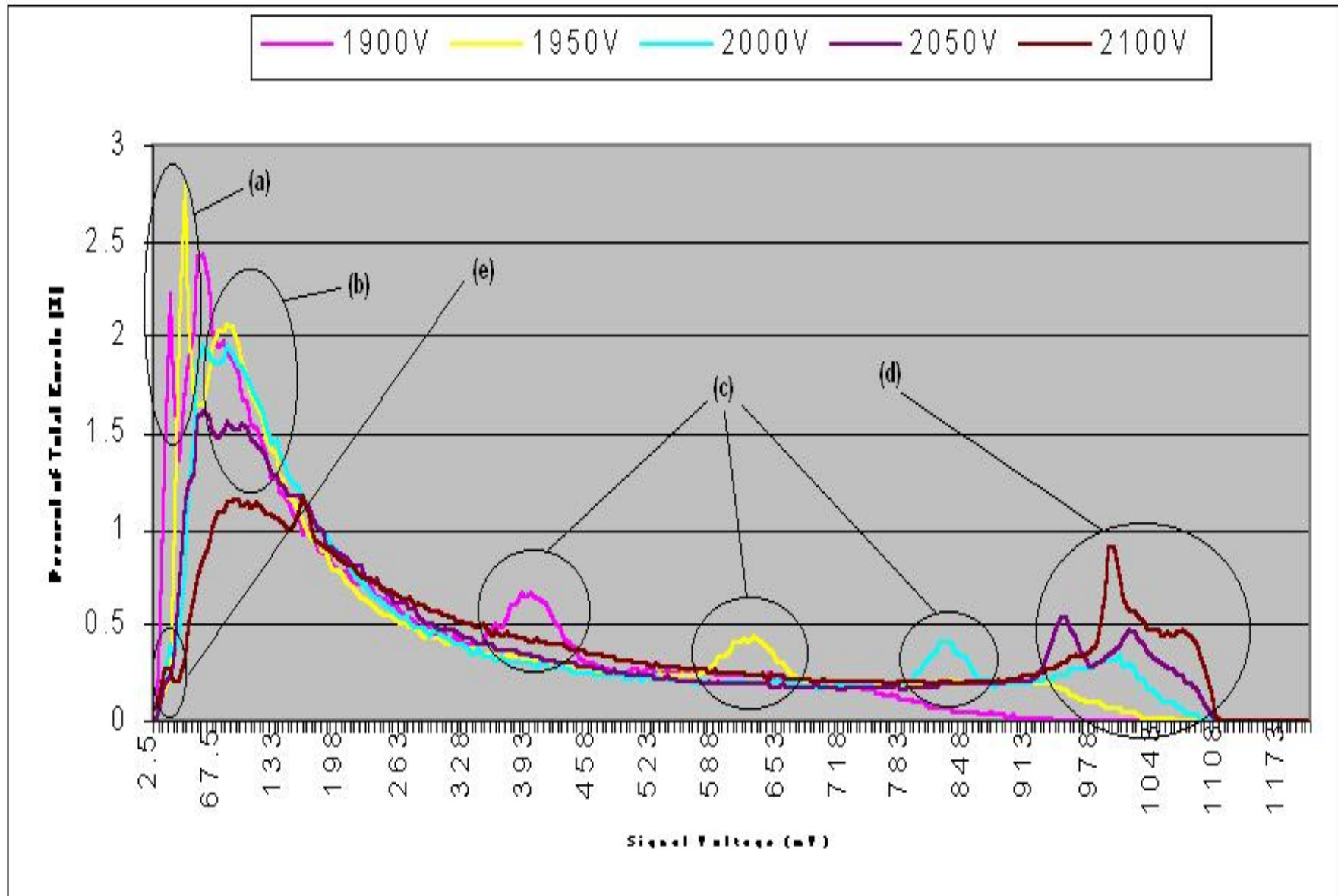


- Shaded regions represent the emissions from each average emission type that would be detected

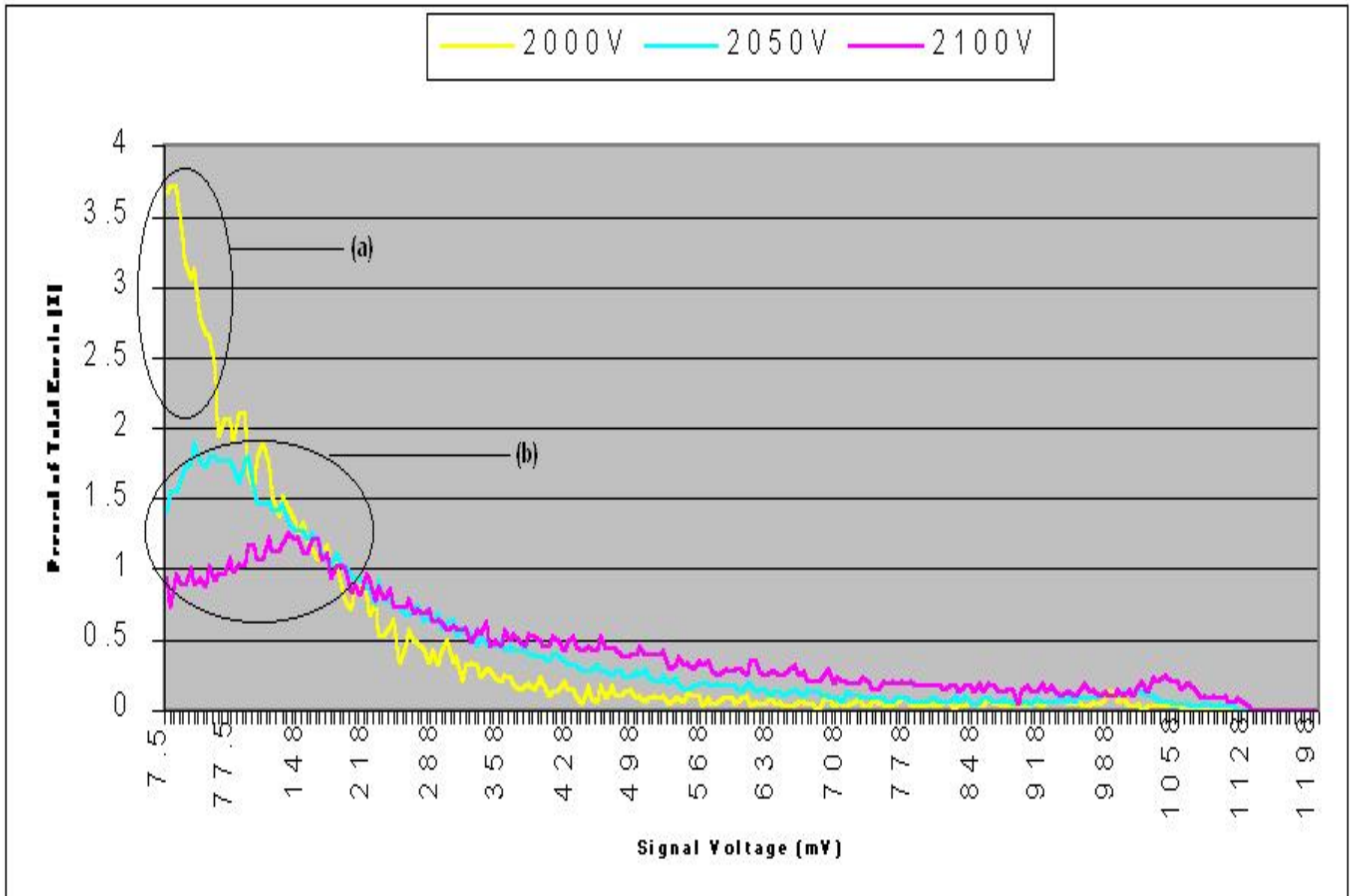
# Cs-137 Source Ar:CO<sub>2</sub> 70:30



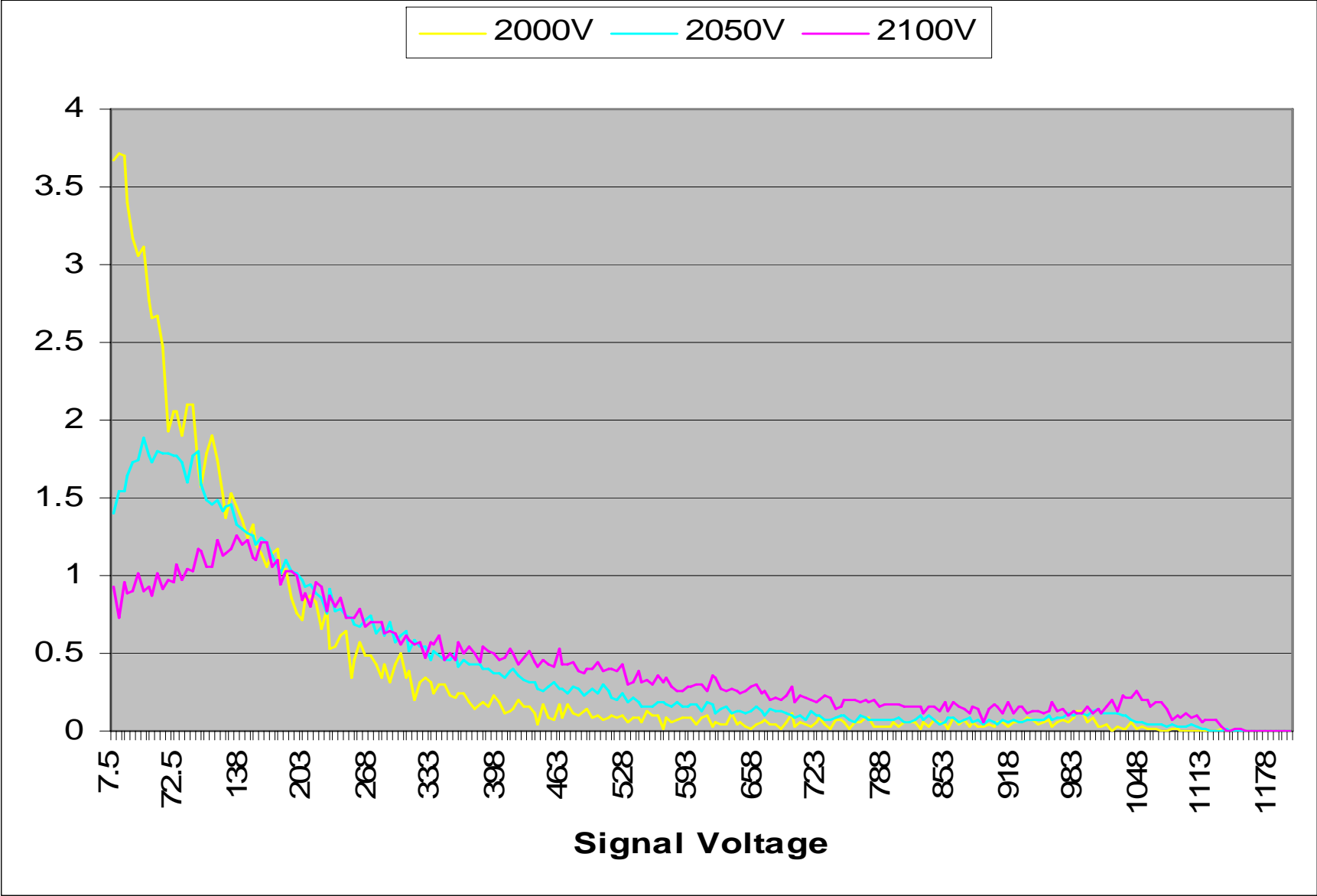
# Cs-137 Source Ar:CO<sub>2</sub> 80:20



# Cs-137 Source Ar:CO<sub>2</sub> 85:15



# Sr-90 Source Ar:CO<sub>2</sub> 85:15





# Conclusions

- Need a few more runs to get more conclusive results
  - Need Sr-90 with 80:20 and especially 70:30 Ar:CO<sub>2</sub> gas mixtures
- If my hypothesis is correct, lower CO<sub>2</sub> content and higher operation voltage is a more accurate combination