THE CATHOLIC UNIVERSITY of AMERICA

Status of PWO crystal characterization setup at CUA

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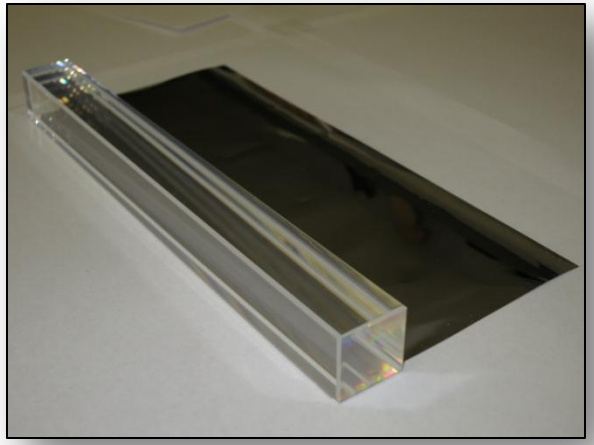
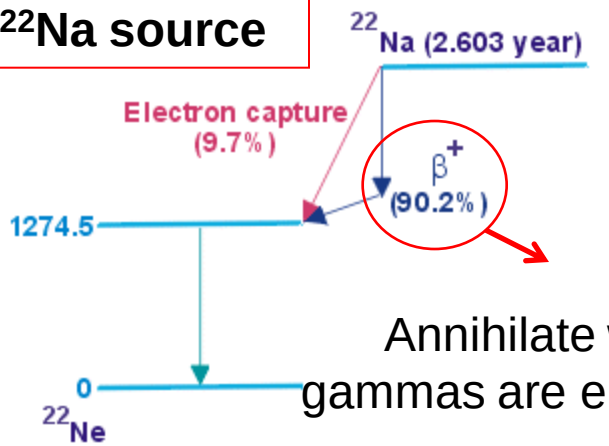


June 15th, 2015

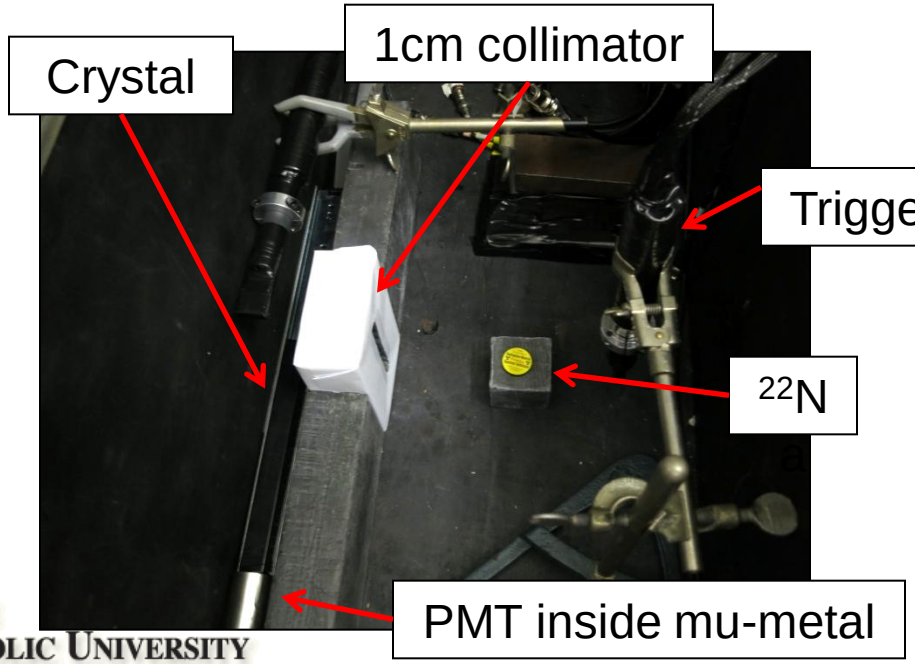
Relative light yield measurements

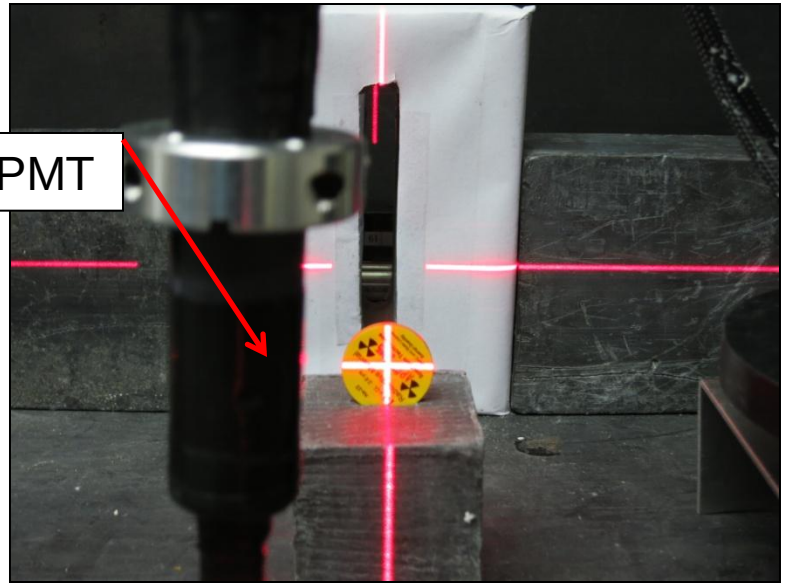
^{22}Na source



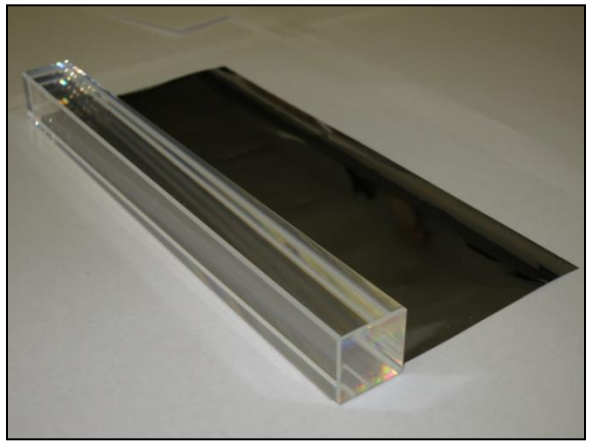
Annihilate with e$^-$, and two gammas are emitted back to back

Dark box



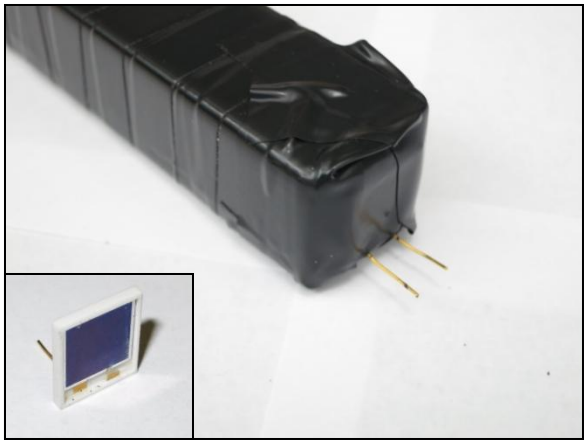


Crystal preparation



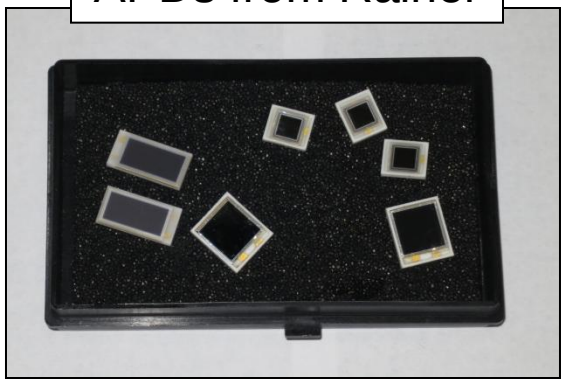
Wrapping crystal with specular reflector

Attaching PMT with optical glue



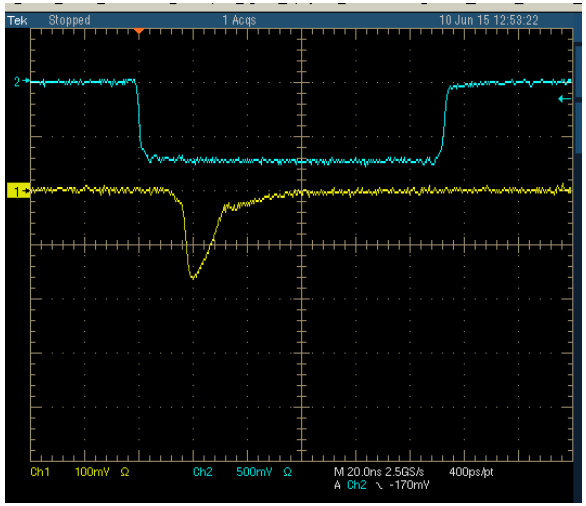
APD (no glue used)

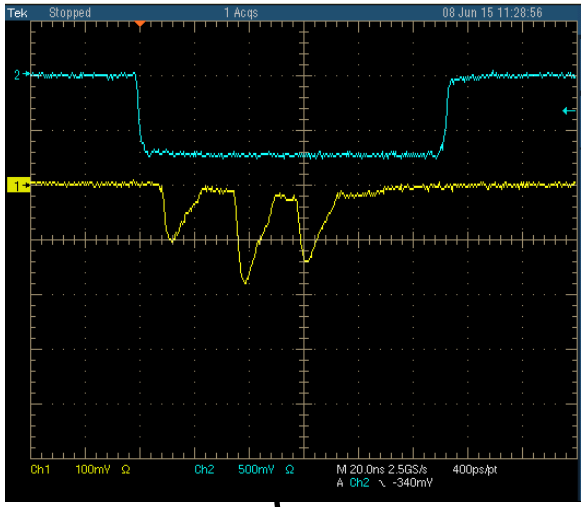
APDs from Rainer

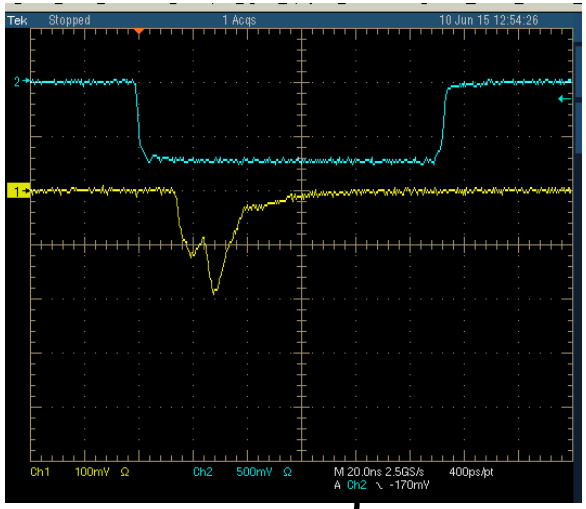


Undergoing measurements

Studying the signal from single events

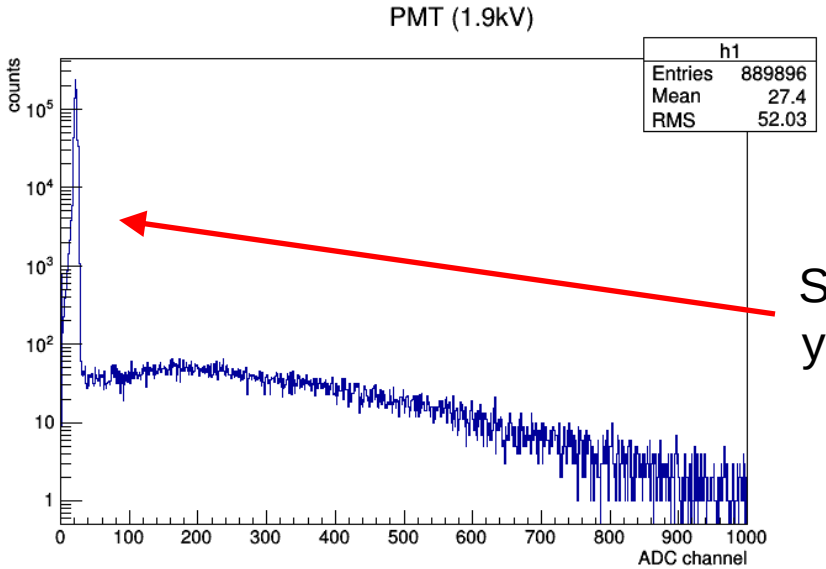






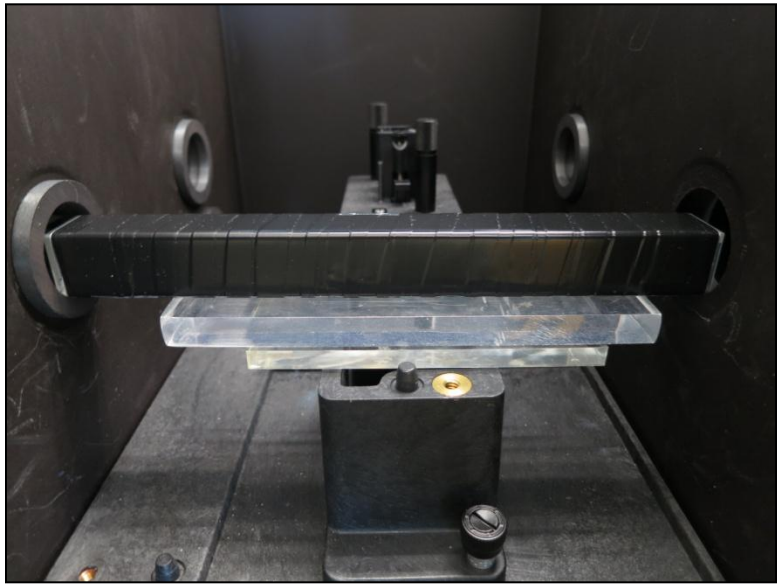
Single peak

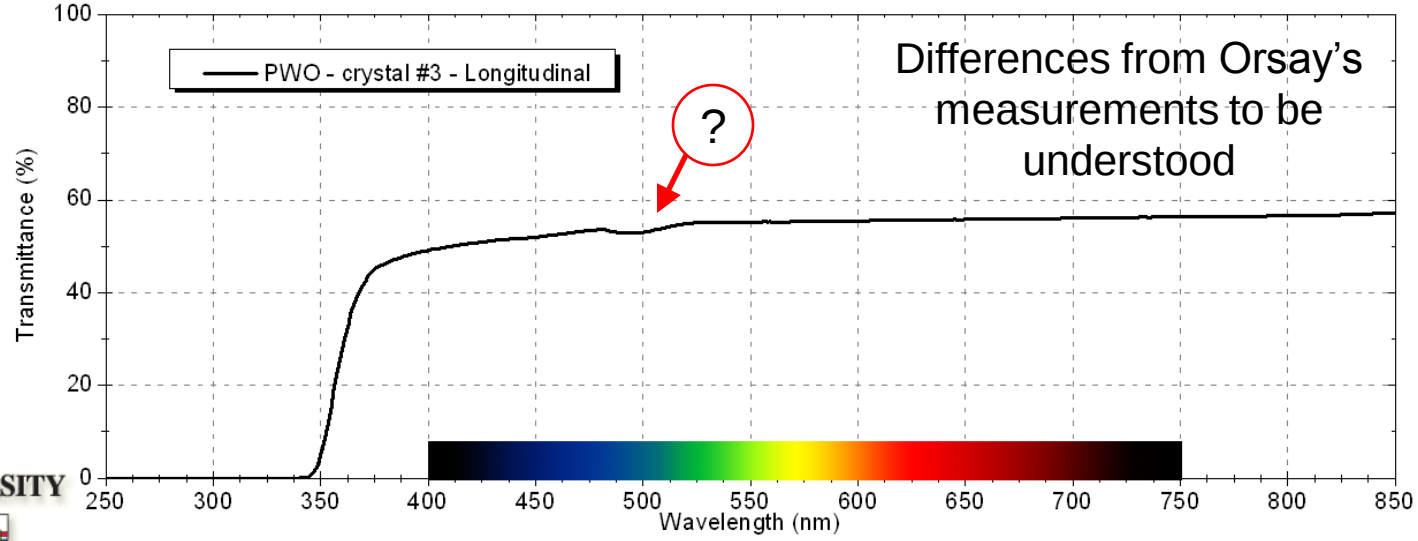
Multiple peaks with variable distances?
Multiple hits?



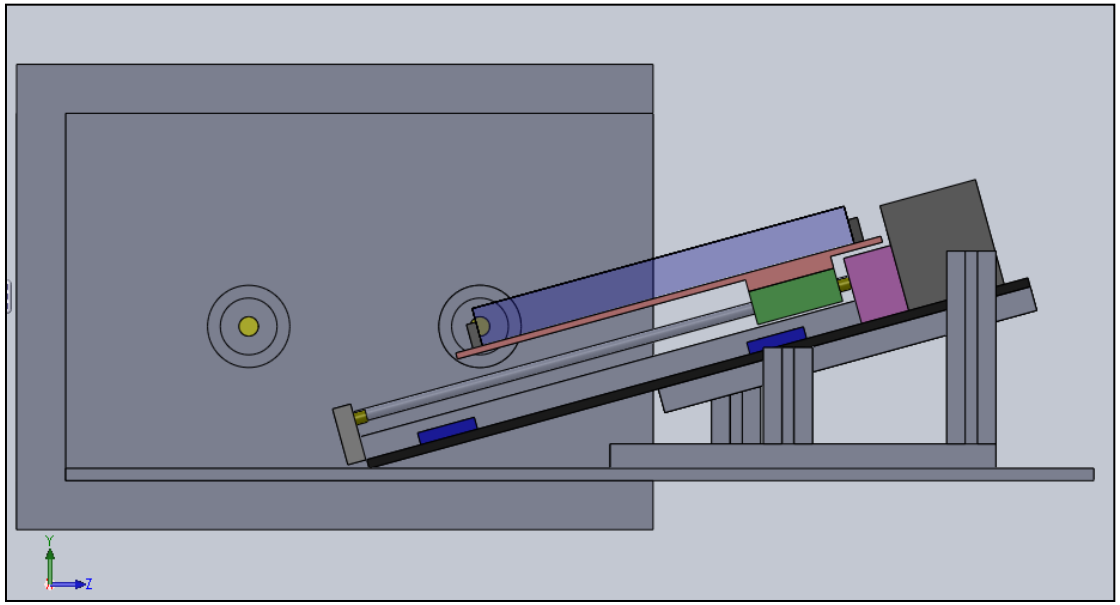
Spectrum calibration:
SEP and pedestal not resolved yet (amplifier needed, ordering CAEN V975)

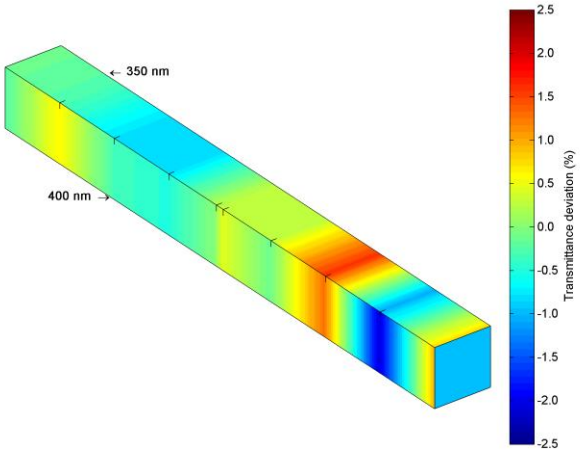
Light transmittance - Longitudinal

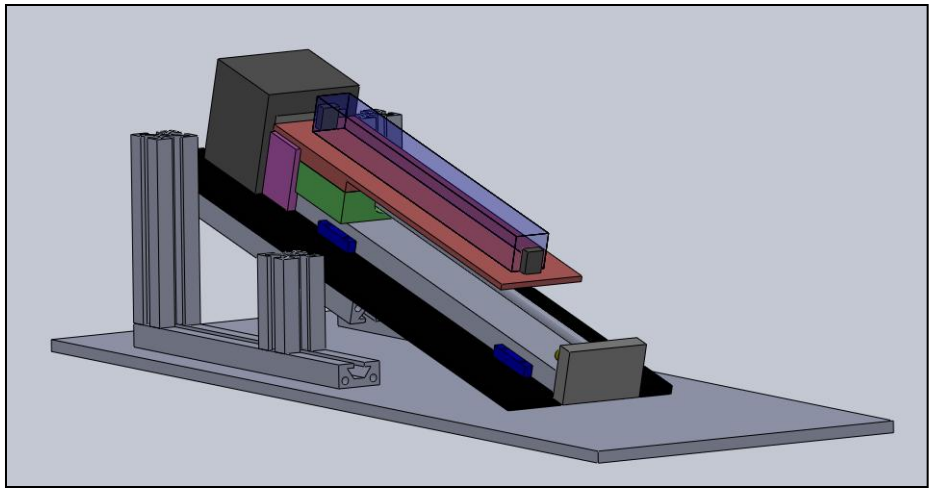




Light transmittance - Transverse







First (manual) scan of the crystal: plotting the deviation of the transmittance with respect to the mean value at 2 wavelengths

Other possibilities?

Composition

- X-Ray Fluorescence (XRF)
- Elemental composition analysis
- May allow for position dependent analyses (scan)
- Restriction: do not go deep in the crystal (surface analysis)

Temperature dependent light yield

- PWO light yield is sensitive to temperature
- Use a small freezer as dark box (with a heater inside to stabilize temperature)

Crystal intrinsic radioactivity

- Measurements of the decays products in a shielded box