Data Preprocessing Update

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AIOP Photon Beam Meeting
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Data collected

- Spring 2023 Phase II data saved at /group/halld/Users/moranp/data
- Working on Summer 2022 CPP data
- Both run periods used 50 μm thick diamond radiator JD70-103

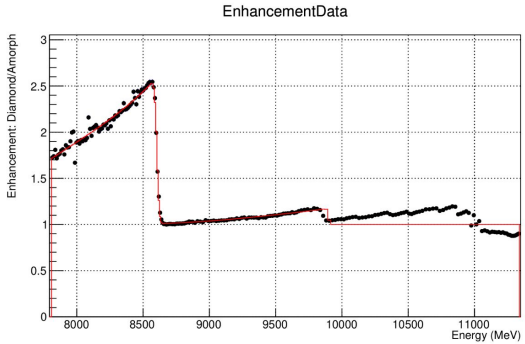
Data Filtering Steps

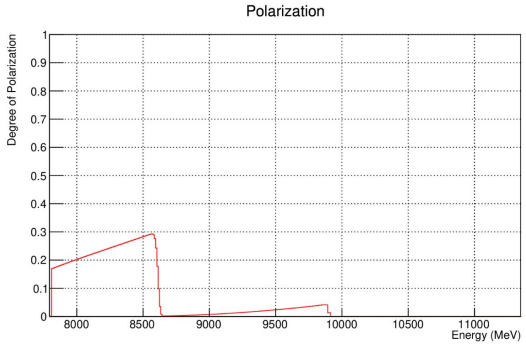
1. Grab raw data from archive in 1 second time steps with mySampler
2. Remove time steps without diamond on beam (“Al” or “Retracted” or “Undefined”)
3. Mark the start of nudge event when pitch and/or yaw angles are changed
4. Mark the end of nudge event when:
    a. 10 seconds have elapsed since last nudge (to account for lag between goniometer and coherent edge)
    b. 30 seconds have elapsed since the beam has ramped up, in cases where the beam is down (to account for lag between beam and coherent edge)
5. Fit the enhancement spectra for the remaining nudge events to obtain the height, width, slope of the primary peak (edge position already in archive)

Fitting Enhancement Spectra

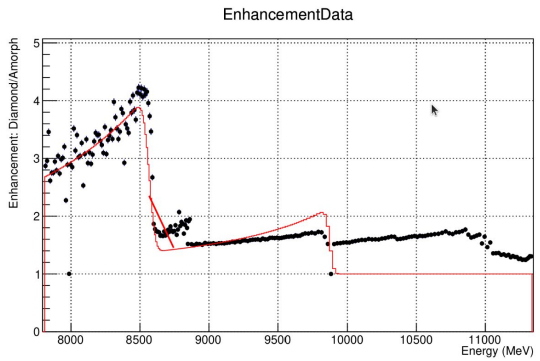
- Fitting code provided by Justin Stevens: https://github.com/JeffersonLab/hd_utilities/tree/master/cobremFit
- Based on Ken Livingston's model
- Archive does not contain energy mapping of counters or enhancement spectra
- Archive does contain individual counter rates
- Seeing strange behavior in the enhancement spectrum reconstructed from archived data between about 8.6-8.9 GeV

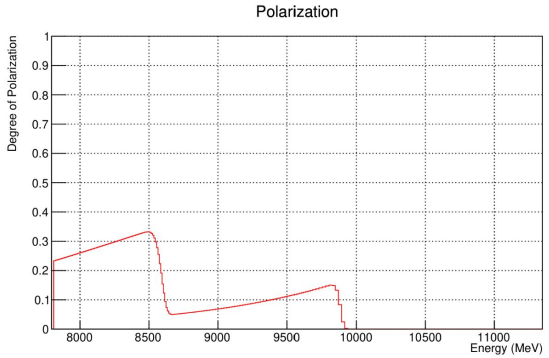
Fitting Enhancement Spectra





From reference





From data

Fitting Enhancement Spectra

- Archive contains:
  - 102 TAGM counter rates (*TAGM:T:N:scaler_t1*, where N=1-102)
  - 233 TAGH counter rates (*TAGH:T:N:scaler_t1*)
  - Amorphous scaler rates (*HD:CBREM:AMO_SCALERS*)
    - Single EPICS variable in the form of a list of 500 values (just over half are zero)
- CCDB contains energy mapping for TAGM/TAGH counters in “scaled_energy_range” tables
  - Contains 102 TAGM counters (same as archive)
  - Contains 274 TAGH counters (as opposed to 233 in archive)
- A. Somov provided me the mapping on the right
- My current procedure is to stitch the 102 TAGM counters in between TAGH #127 and TAGH #138 (325 total counters)
  - Divide those by amorphous counters (but there are only about 230 amorphous counters)

The TAGH translation map:

Counter ID	Scaler
1	1
…	…
127	127
Gap	
179	138
…	…
274	233