

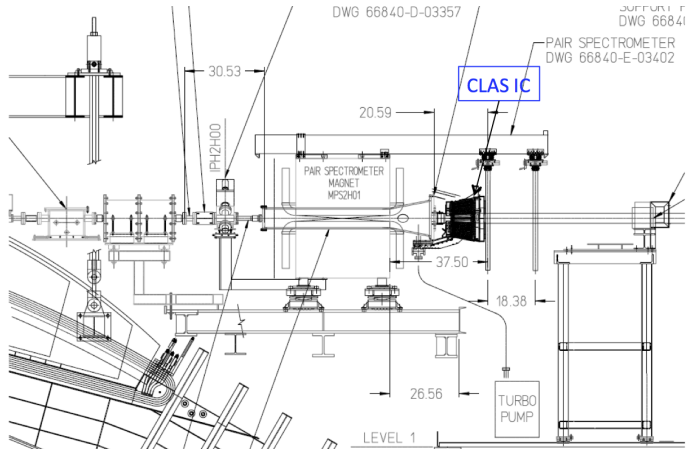
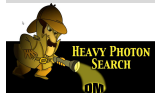


# Parasitic ECal DAQ status



Jan 3<sup>rd</sup> 12

# Parasitic stage 1 setup





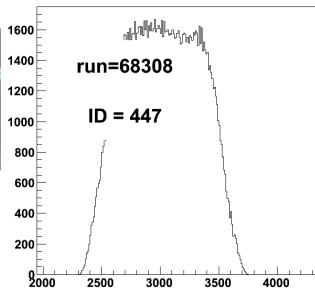
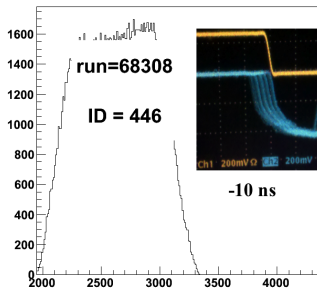
Purpose : make sure the detector signal is within the ADC gate window

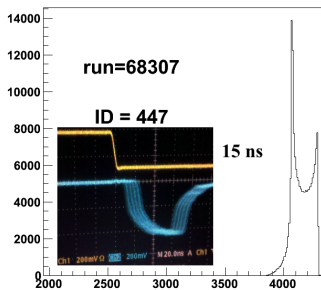
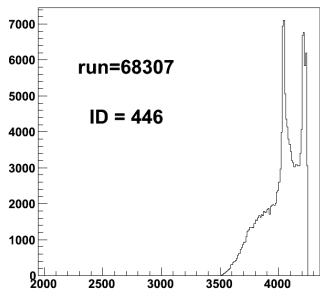
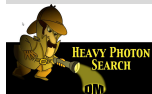
Method : use rectangular generator signal replacing output of two contiguous channels

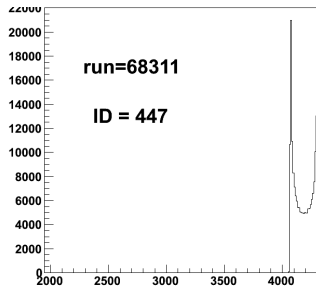
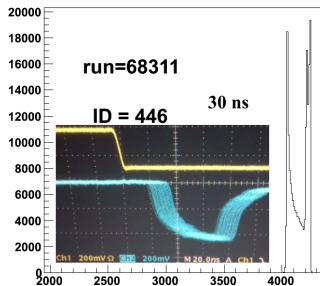
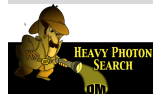
trigger on single cluster with at least two crystals above threshold

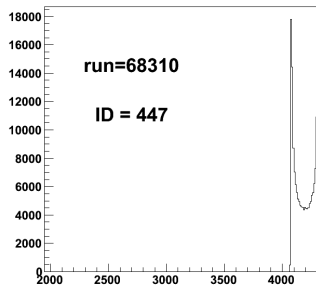
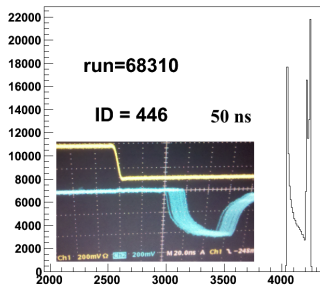
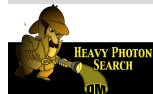
4 configurations tested :

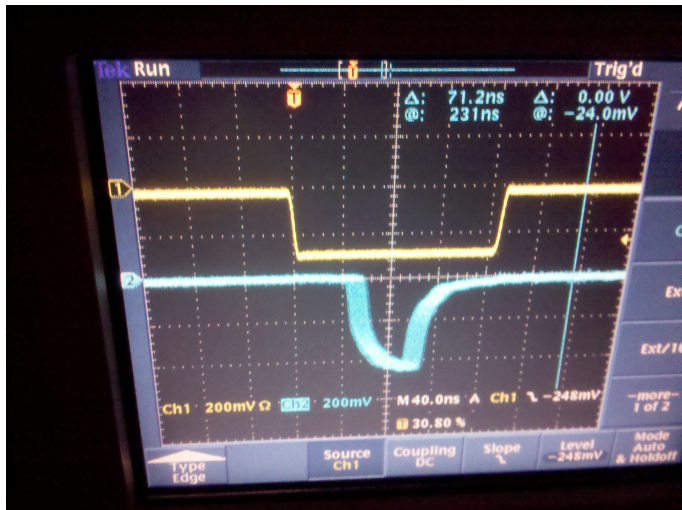
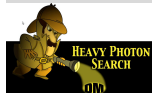
- with two versions of the trigger board firmware. Made faster by removing capabilities for hodoscope (not in use here)
- with the removal of cable length delay for the ADC gate signal





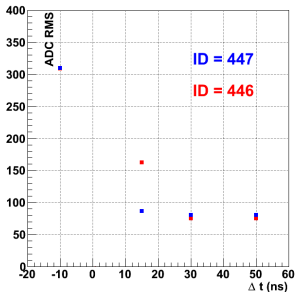
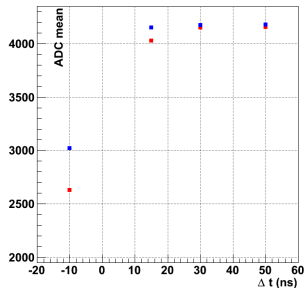
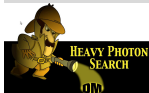




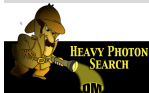




# Result of the DAQ timing check

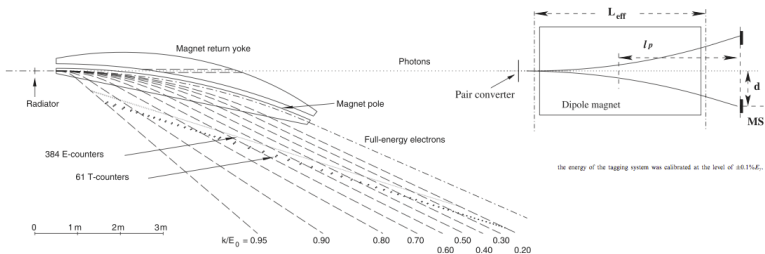


# Two-cluster trigger, calibration and energy reconstruction check



Energy calibration of the JLab bremsstrahlung tagging system

Nuclear Instruments and Methods in Physics Research A 572 (2007) 654-661



HDice parasitic :

$$E_{beam} = 2.2 \text{ GeV}, I_{beam} = 5 \text{ nA}$$

$$\text{radiator} = 10^{-4} \text{ Au}$$

$$\text{converter} = 1.6\% \text{ Al}$$

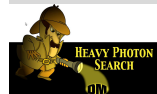
$$B_0 = 0.22 \text{ T}$$

$$l_p = 1.12 \text{ m}$$

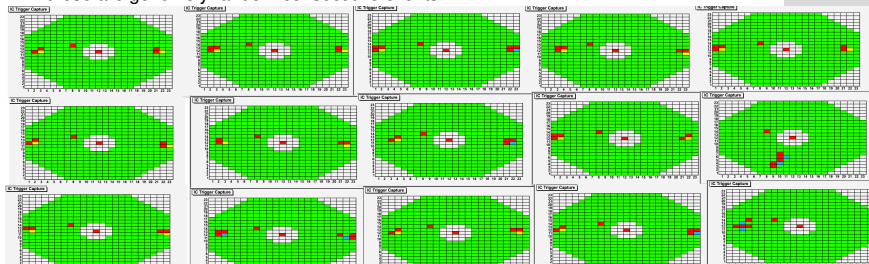
$$P = 0.3 B_0 L_{eff} \sqrt{\left(\frac{l_p}{d}\right)^2 + 1}$$

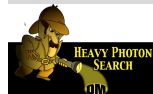


# Sample of typical events from the trigger GUI

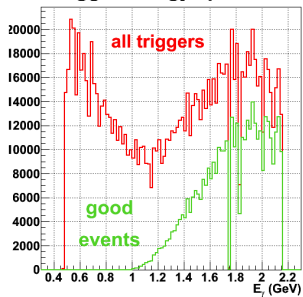


N.B. these are genuinely random consecutive events

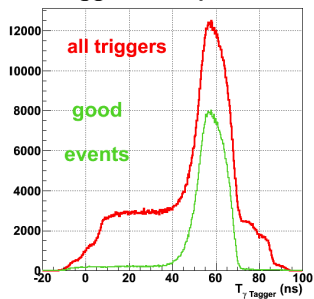


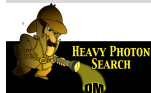


Tagger energy spectrum

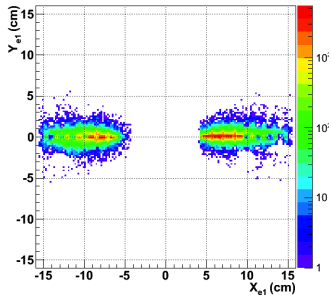


Tagger time spectrum

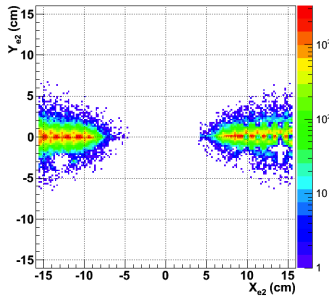


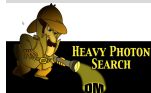


Most energetic cluster position

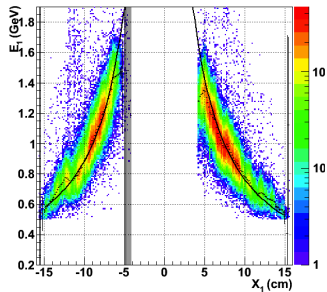


Least energetic cluster position

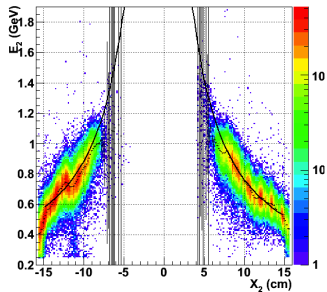


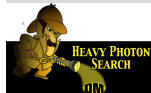


Most energy vs transverse position

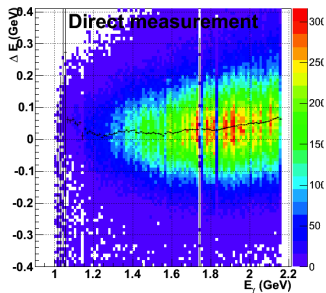


Least energy vs transverse position

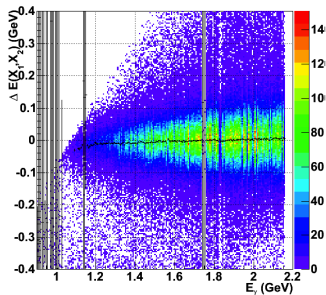




Missing energy vs tagger energy



Missing energy(cluster position) vs  $E_\gamma$

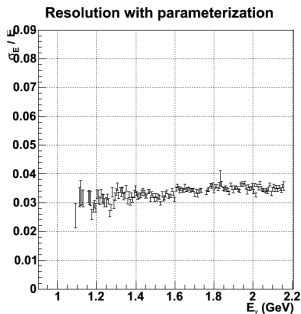
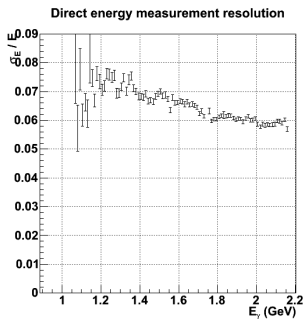
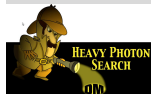




# Energy reconstruction performances before calibration

HPS - ECal status  
Jan 3<sup>rd</sup> 12

F.-X. Girod



Short-term plan :

perform calibration with the momentum(position) correlation of pairs

move to JLab fADC readout and check performances again