HMS Electromagnetic Calorimeter
commissioning plan
(December 2017)

It is assumed that prior to commissioning the calorimeter is energized and signals from all the channels are checked out. The experts in charge for commissioning will be Hamlet Mkrtchyan, Arshak Asaturyan and Vardan Tadevosyan.

Initial Detector Checkout

Expected time: 1 hour
Goal: check signal timing and fADC thresholds
Conditions:

- Beam: 2.2 GeV, 5-20 mA, fast rater off
- Target: 0.5% carbon
- Collimator: PION
- Trigger: SCIN ¾
- HMS angle: 25°,
- HMS momentum: -1.6 GeV/c

- Establish last summer HVs in all the channels. Take a short run (a few 100k events) with fADCs in mode 9, look into the accumulated pulse spectra to ensure good timing and fADC thresholds. Tune timings and thresholds. Repeat if needed.

Detailed Detector Checkout

Expected time: **?** hour
Goal: gain matching, calibration
Conditions:

- Beam: 6.4 GeV, 5-20 mA, fast rater off
- Target: 0.5% carbon
- Collimator: Sieve
- Trigger: SCIN ¾
- HMS angle: 25°,
- SHMS momentum: -1.6 GeV/c

- Take a run of a few 100k events. Analyze it. Identify m.i.p. pions by posing cuts on the Gas Cherenkov signals, and requesting fired modules in a single row. Also select tracks with Y coordinate of the hit position at the calorimeter within the range of +/- 10 cm.

Plot ADC signal spectra, locate m.i.p. peaks in each channel. Change HVs in order to equalize the peak positions. Repeat if needed.

- Take a run of a few 100k events. Analyze it and run the calibration code to get new gain constants and representative plots. Check if resolution of the electron peak in the plots is consistent with prediction.

<u>Defocused run</u>
Expected time: **?**
Goal: get Y dependence of PMT signals
Conditions:

- Beam: 6.4 GeV, 5-20 mA, fast rater off
- Target: 0.5% carbon
- Collimator: PION
- Trigger: SCIN ¾
- HMS angle: 15°
- HMS momentum: -3 GeV/c

- Take high statistics run(s) in order to get Y coordinate dependence of PMT ADC signals. The data can be used to revise Y-correction of the PMT signals in the analysis code.