Comissionning plan for the Hodoscope

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The Comissionning of the Hodoscope can start when the beam is succesfully established to the Faraday Cup, and the target is inserted.

1 Choosing HVs for PMTs

In order to choose the right HV for Hodoscope PMTs (Model Hamamatsu H8711-10), we need to do a "Fast scan" with different HV settings, to make sure the divider current increase is not too much. According to the Hamamatsu data sheet for this PMT [1], it is suggested that the anode current to not exceed more than 5% the divider current with standard conditions (No beam).

Here "Fast scan" means with different HV settings change the beam current up to the production current, starting from 0 in total 5 steps. Repeat this for 5 HV settings: 740 V, 760 V, 780 V, 800 V and 820 V. After the scan, for each PMT we will chose the highest HV in which case the increase of anode current is closest to 5%.

2 Measuring pedestals

There can be variation of a pedestals as a function of the beam current. Especially for Hodoscope, it is important to have pedestals as precise as possible as TET for Hodoscope is small compared to ECal. We will measure pedestals using the "fadc250peds outFileName" command. We will measure it with 5 luminosity settings: "prod_Lumin", "0.75· prod_Lumin", "0.5· prod_Lumin", "0.25· prod_Lumin" and 0. For each setting we will need about 2 min of stable beam.

2.1 Pedestal dependence as a function of HV

In order to check if there is a dependence of pedestals on the HV, we will request a production beam current, for 5 HV settings 740 V, 760 V, 780 V, 800 V and 820 V measure pedestals (2 min for each setting).

3 Runs for gain calibrations

Although initial gains for the Hodoscope will be set from cosmic runs, however we observed gain dependence on the luminosity, so as soon the the good HV will be chosen for the Hodoscope, we will need to take one run with the following trigger file "hps2021_Validate_Prod.trg". It will trigger only using the calorimeter Position Dependent Energy (PDE) cut. 10 M events should be enough. Later during the experiment, if it will be decided to change HV on PMTs we should take another similar run for gain calibration.

References

[1] Hamamatsu Datasheet for the H8711 series: https://www.hamamatsu.com/resources/pdf/etd/H8711_TPMH1320E.pdf