NP02 - PD

Progress and Plans - July 23, 2025

Approved Procedure: Installation, commissioning and operation of the NP02 Photon Detector System

EDMS # 3287089

FLC & PD Team at CERN

Impact #4

Week July 9-16:

- **Beam and BI commissioning:**
  - Beam Trigger-DAQ development/synchronization - with PD in DAQ
  - Beam (energy) Calibration ***[PE to GeV]*** Runs for Cathode Modules (e.g. e-beam energy ramp: (0.5)1-7 GeV) [from remote via DAQ - possible accesses to NP02 for troubleshooting]

Use of Beam for PD Calibration and overall PD commissioning during the beam ON week (agreed on day-by-day proposals)

== >~8 M Beam Triggers recorded with PD-DAQ ON
(3 beam config's: +12 GeV/c, +5GeV/c, +2GeV/c)

TABLE III. Trigger rate at the NP-02 experiment for a W (0.4–3 GeV/c) target and a Cu(4–12 GeV/c) target for the case of H2-VLE. The rates correspond to 10^6, 80 GeV/c secondary particles generated at the T2 target.

Momentum [GeV/c]	Electrons	Kaons	Muons	Protons	Pions	Trigger rate [Hz]
0.4	7	0	0	0	0	7
1	21	0	0	4	3	28
2	17	0	0	7	12	36
3	14	1	1	10	30	56
3	145	1	1	16	49	213
4	117	3	1	16	80	218
5	94	5	2	20	100	222
6	77	9	2	25	133	247
7	69	11	2	28	169	279
8	59	16	3	35	193	305
9	51	19	3	37	227	337
10	46	22	3	45	254	370
11	41	27	3	53	268	393
12	38	29	3	60	292	422

Weeks July 17-29 (current):

- **No Beam - =>** **(PD) Detector Development period**
  - Membrane PD - 2 faulty channels M1(1) and M2(1): fix + noise source search and mitigation—> ***done / in progress***,
  - Cathode PD - 1 faulty channel C3(2): fix —> ***done***)
  - Calibration (LED Mask scan, VGAIN scan, Membrane/VBIAS scan, Baseline set ==> **SNR for all channels —> *in progress***
  - PD Rack modification - second 3-fan 1U on a side - to mitigate T rise when PoF Laser ON —> ***Test on-going now***
  - DAPHNE configuration (Membrane Modules) modification and test
  - Plan for Data taking in next Beam On period (starting July 30) - under discussion/tbd