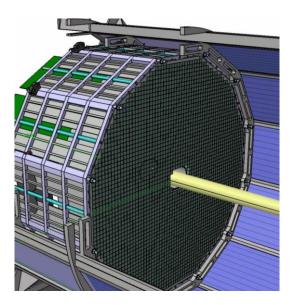


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> Need to monitor:

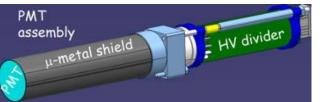
- Radiation damage (crystals, SiPM...)
- Temperature: PWO light yield varies 2%/°C
- > Current plan:
 - > Light monitoring with LEDs from the back of the crystals (with or without fibers)
 - > Temperature sensors across a selected (but large) number of crystals
- > Calibration will be done with physics (π^0 mass, electron tracks...)
- > Monitoring system is only aimed at detecting significant gain variations/drifts



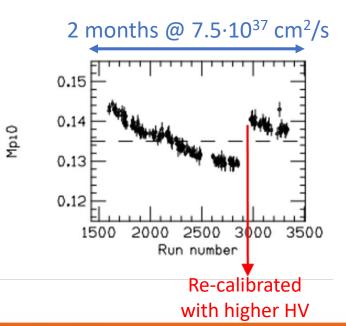
Backward Ecal "prototype": NPS calorimeter

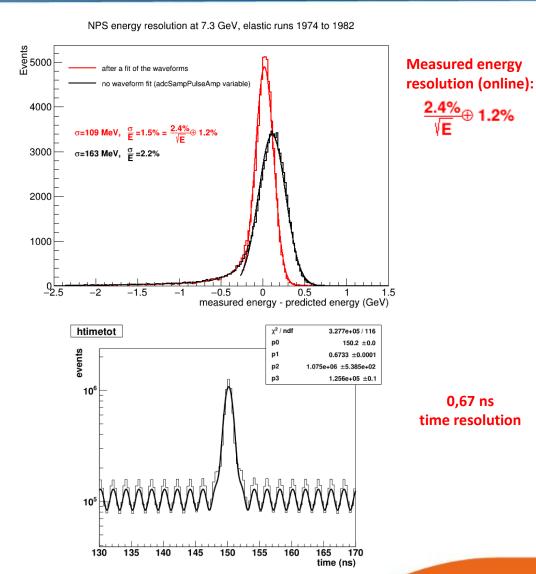
- > 1080 PWO crystals
- PMT readout
- Currently running at JLab in Hall C

High luminosity: 7.5·10³⁷ cm²/s



0.5W/channel = 540W total





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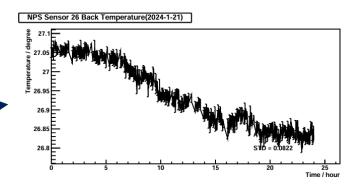
Laboratoire de Physique des 2 Infinis







8 18.8544	19.8089	20.4771	20.5785	20.1315	18.5238	17.64	28
7 19.4476	22.9066	24.862	25.0845	24.2286	21.4267	18.0522	- 26
6 	24.6917	27.2834	27.8325	26.6142	23.1183	18.1025	24
5 	25.1952	27.8167	28.1713	27.3002	23.3546	18.075	- 22
4 19.927	24.1628	26.8838	26.9315	26.4752	22.9409	18.0529	
3 19.6283	22.7035	24.5829	24.8451	24.3606	21.6908	17.8687	20
2 19.1889	21.1015	21.9575	22.1667	21.8971	20.08	17.8797	- 18
1 18.7615	19.0541	19.2847	19.1271	19.269	18.0531	17.707	- 16
0	1 2	2 :	3 4	4	5	6 7	1
8							28
15.6923 	16.3622	16.9068	16.8625	16.6736	17.8844	17.2805	
16.0498	17.9985	19.3461	19.5047	18.9608	19.4915	17.681	- 26
D 16.3302	18.9259	20.7388	21.084	20.56	20.5524	17.9703	<u> </u>
16.3662	19.2978	21.1056	21.5902	20.8206	20.8011	18.1157	22
4 16.3348	18.9923	20.3014	21.071	20.5997	20.6492	18.1325	22
3 16.1124	18.0832	19.231	19.6342	19.4273	19.8362	17.9084	20
2		17.7146	17.9541	17.8365	18.8142	17.6288	- 18
1 	15.8722	16.024	16.0552	16.0295	17.6089	17.391	
0 · · · · · · · · · · · · · · · · · · ·							— 16



- Good stability achieved: ±0.1°C
- Very slow temperature variations: O(days)
- Significant gradient across the surface
- Significant gradient across crystals
- Light yield can be potentially corrected with temperature data

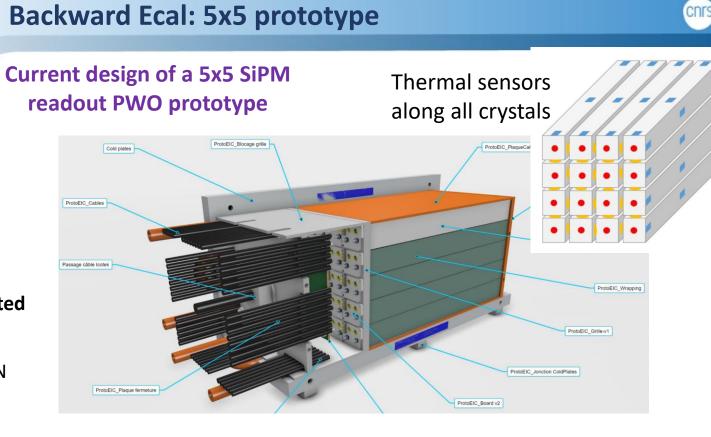
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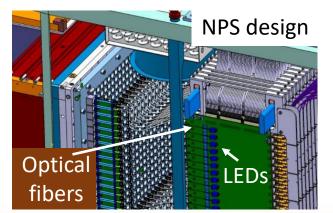


Primary goal:

thermal stability studies

- Can be fully instrumented for beam tests:
 - > April/May @ CERN
 - Fall'24 @ JLab







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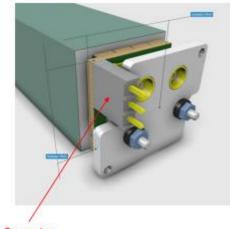
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Connector for the LED

- Need to test rad hardness of LEDs
- Alternate solution: deport LED and use fibers to bring the light (solution used in NPS)