

Status of the CEDAR Upgrade Project

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with contributions from other members of the CEDAR project

Status 1/2

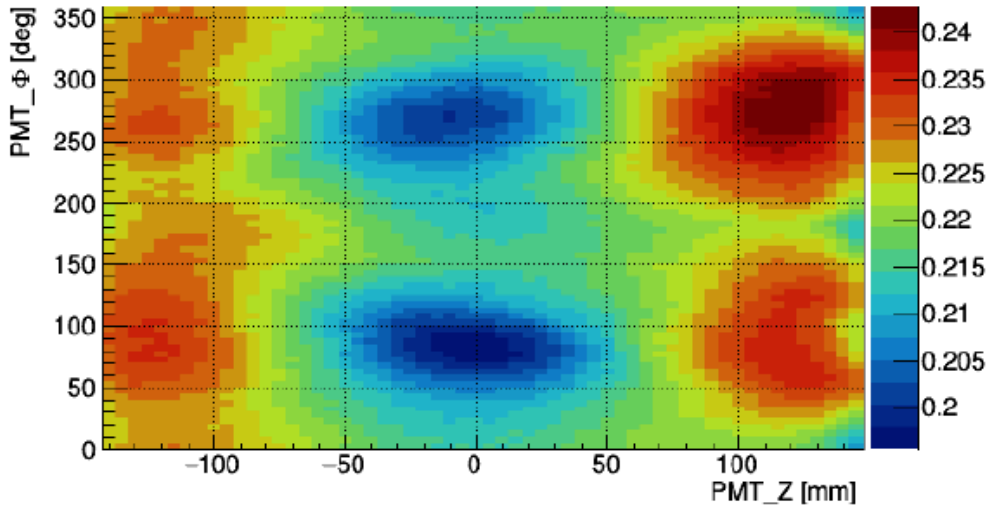
- Discriminators:
 - Ready tomorrow (confirmed with assembly company)
- Dividers:
 - PCBs ready, have all the parts, currently assembling prototype
 - Caught significant delay due to administrative issues – all purchases of ICs were blocked by administration due to exceeding some threshold for tenders
 - All units ready on Friday; will be tested in CERN (we're bringing spare parts & all the tools)
- Mechanics:
 - Turned out not much needs to be done, only endcap needs modifications (see later slides)
- Optical system:
 - Finalizing board assembly, have all the parts
 - A new graduate student designed and prepared this system (Adam Klekotko).
- TDC
 - On schedule

Status 2/2

- VME crate may be a problem (none available at E-Pool – checked yesterday)
 - Have one in Warsaw that could be brought to CERN for the time of the run
 - Has a broken mains switch, but we will replace it today and see if it works.
 - The crate is anyway just a power supply – so if necessary, we may try some quick fix if out of options
- Planned to measure all PMTs in Warsaw, but failed
 - Wen-Chen sent them on March 15th
 - They arrived at Warsaw on March 16th
 - Spent over 3 weeks at customs office, got them yesterday
 - Sending package to CERN today (hopefully it arrives on time)
 - Rate test:
 - Confirmed they can work up to 10 MHz at nominal gain
 - Able to work at 40 MHz trigger rate, with reduced gain
 - Will use standard divider, as all dynodes are supplied from low impedance drivers and we need as high gain as possible while not exceeding max. anode current
 - Got better collection efficiency results using standard divider.
 - Optimal position:
 - Between 120 mm and 130 mm from current photocathode position (fits well with existing mechanics).
- Coming to CERN on April 16th, three people
 - Intend to work for 2 weeks, incl. weekends

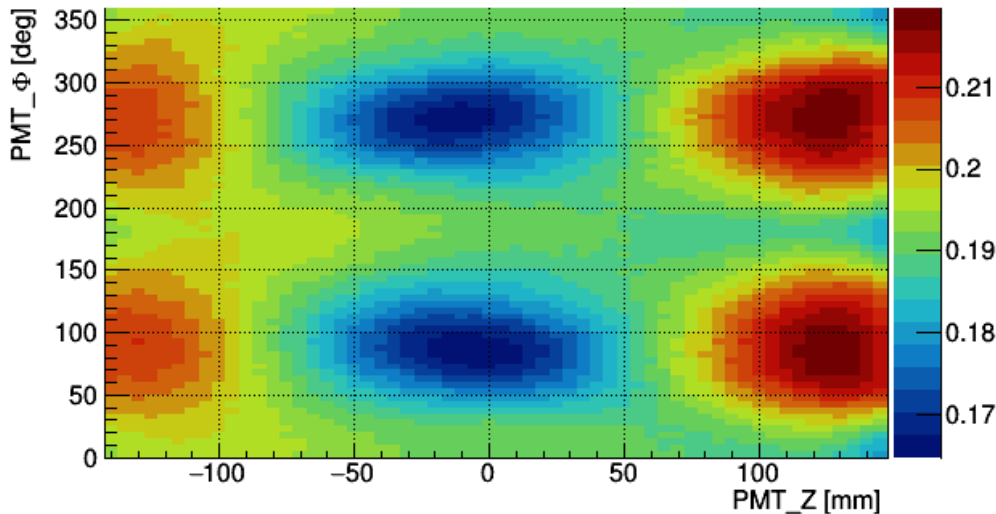
PMT Simulation (Flavio)

PMT G.Acc.*Q.Eff*C.Eff vs PMT_z vs PMT_φ - T= 21.800 C, LD= 0.500 mm



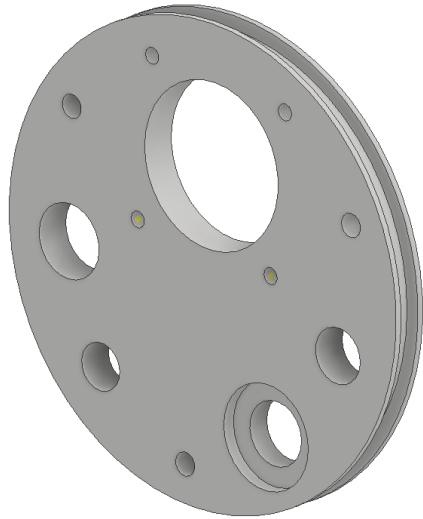
$$\text{Overall efficiency} = G_{\text{acc}} * Q_{\text{eff}} * C_{\text{eff}}$$

PMT G.Acc.*Q.Eff*C.Eff vs PMT_z vs PMT_φ - T= 21.800 C, LD= 0.500 mm



- Simulation take following into account:
 - Emission spectrum, incl. cutoff at short wavelength
 - Quantum efficiency of photocathode
 - Geometrical acceptance at a given position
 - Collection efficiency measured at WUT

Current End Cap

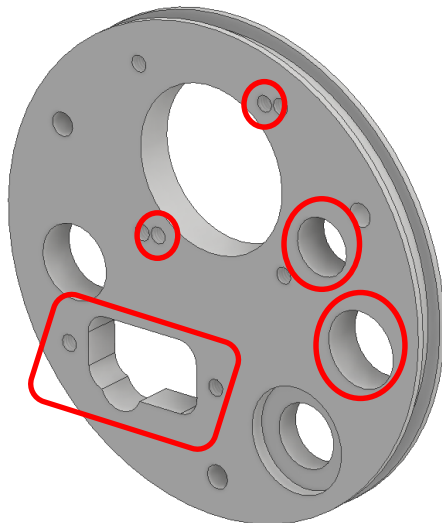


Mechanics

Access to workshop (near 888)
needed for approx. 2 days



New End Cap

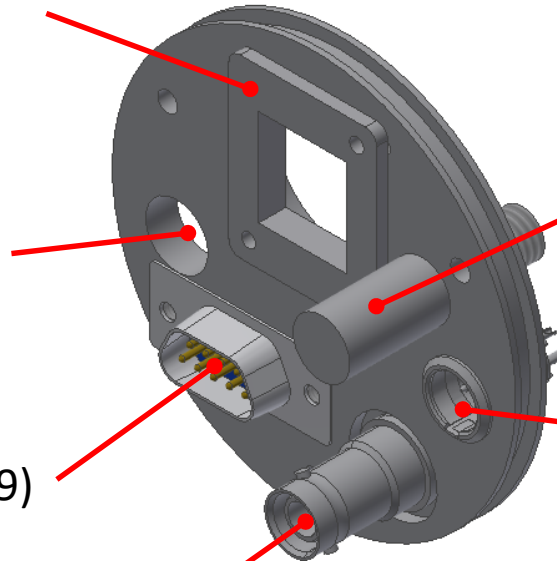


Fiber feed-through

Air filter
(no change)

Signal (DB-9)

High voltage
(SHV)



Air feed-through
(current
connector)

Low voltage
(mini-XLR)

Summary

- At non-negligible risk of delay, but still roughly on track
- Three people from WUT coming to CERN on April 16th
- Two of us travel with a car, will bring a lot of equipment with us, so that we are not too much reliant on E-Pool
- Need 6U VME crate – as a backup can bring one from Warsaw, but it is relatively old
 - In any case, we use it only as power supply and place to keep card, so if necessary we may use any 6U crate and make adapters.
- Signal cables already purchased; HV cables need to be identified; SHV connectors and HV cables available in CERN stores (checked today).
 - We will check this on Monday, April 16th, as soon as we arrive at CERN.