

EIC R&D – MPGD-based - Discussion

EIC INPUTS

MPGD-based (GEM + MM) -- this should emphasize the efforts of material reduction for MMs and the work towards capacitive readout based uRWELL?, overlap with WP2: Gas Detectors, sub-topic GEMS, micro-megas or uRWELL

Our current MPGD-based efforts focus on:

- **Micro Pattern Gas Detector Technologies** (GEM, mm, uRWELL),
- **Resistive elements** (protection/quenching and charge sharing),
- Precise (O 25ps) **timing** (PICOSEC mm, **UV photocathode, electronics**),
- **Simulation and Modelling** (signal induction with resistive elements, applicable to silicon, RPC,..),
- High rate charge/time **Front End Electronics** and DAQ (VMM3a and RD51 SRS),
- **Photon** (Optical, UV) readout,
- **Gas** (eco, RPC as well CF4 based mixture for MPGD/PID,timing).

Key role – technology wise - of the **EP-DT Micro Pattern Technology (MPT) workshop** (R. De Oliveira) for R&D phase on new structures and for MPGD production

EP-RD program / potential synergies (I)

MICRO PATTERN TECHNOLOGIES

- **GEM** high rate 2D readout (synergy with AMBER/COMPASS++)
- **uRWELL** high rate 2D readout (synergy with RD51)
- **mm** (synergy with PICOSEC (*) collaboration) see Florian talk yesterday
(<https://indico.cern.ch/event/1063927/contributions/4560071/subcontributions/356562/attachments/2343889/3996374/PicoSec-EPR%26D-2021.pdf>)

(*) Existing links

1. (EIC/Stony Brook) PICOSEC prototype as potential detector to do laboratory characterisation of the DIRC – Interesting application for us as a test-bench for the multichannel PICOSEC prototype.

EP-RD program / potential synergies (II)

MODELLING

- **signal modelling** (with/without resistive element.. in all the readout layout you listed).. See Djunes talk yesterday

(<https://indico.cern.ch/event/1063927/contributions/4560071/subcontributions/356563/attachments/2343905/3996579/EPR%26DDay2021DjunesJanssens.pdf>)

ELECTRONICS

- Multichannel FE & DAQ: RD51 SRS and ATLAS/BNL **VMM3a** (Synergy with **RD51** and **AIDAinnova**)
- FE electronics for **fast timing applications...**
- Damien Neyret , “**Development of a new front-end ASIC for MPGDs at EIC**” talk later in the afternoon...

INFRASTRUCTURES

- Laboratory
- Test beam

Question/Discussion

- Production sites: CERN MPT & Saclay workshop
- Detector readiness (maturity) for detector#1
- Large Area
- 2D readout → Good R&D results in EIC with prototypes from CERN MPT
- Detector#2 good for R&D not yet ready solution