

**Subject:** TIC meeting 8/14,2023 - main outcome

**From:** Silvia Dalla Torre <Silvia.DallaTorre@ts.infn.it>

**Date:** 8/16/2023, 4:09 PM

**To:** eic-projdet-tic-l@lists.bnl.gov, elke-caroline aschenauer <elke@bnl.gov>, eic-projdet-daq-l@lists.bnl.gov, Simon Gardner <simon.gardner@glasgow.ac.uk>, Nathaly Santiesteban <nathaly.santiesteban@unh.edu>, "Hartbrich, Oskar" <hartbricho@ornl.gov>, thomas ullrich <thomas.ullrich@bnl.gov>, Ernst Sichtermann <EPSichtermann@lbl.gov>, matt posik <posik@temple.edu>, Oleg Tsai <tsai@physics.ucla.edu>

**CC:** Lajoie John <lajoie@iastate.edu>

Dear Colleagues,

The TIC meeting on August 14, 2023, has been highly informative about status and plans for the ePIC MPGD trackers, thanks to the rich and careful reports by the speakers. Some points require specific attention and demand a close follow-up.

#### 1) The layout of the three cylindrical MICROMEGAS (inner MPGD)

The concept of a tiled approach to the modular MPGDs of medium size has been appreciated.

The details of the implementation need further refinement, as there remain open questions:

- How large is the extended overlaps between adjacent tiles and what is the related space requirement?
- The tile services seem to consume all the clearance space between the cylinders, while the services of the more inner subsystems may need the same space;
- The routing to the FEE of the signals from the coordinate different from z have to be understood (parasitic capacitance, etc.)

It has been anticipated that these open questions will be addressed among the MICROMEGAS groups, the tracking CC-WG conveners and the Project.

#### 2) microR-WELL and thin-gap approach (outer MPGD)

The thin-gap approach is designed to improve the space resolution for inclined trajectories. The required space resolution is driven by the pointing requirements of the PID detectors and requires further simulation studies. A single thin-gap amplification can provide good efficiency if gas mixtures with heavy gasses (Xe, Kr) as main component are used. The recent shortage of these gasses raises the issue of risk regarding future procurement. Therefore, a hybrid thin-gap option is considered, in particular GEM + microR-WELL. This option is problematic because of the long R&D needed (three years, as estimated by the proponents) and of the opposite mechanical requirements by microR-WELL and GEM foils.

It has been suggested:

- To progress as soon as possible to quantify the needed space resolution via simulation studies (Matt Posik has taken responsibility to follow this progress)
- There are considerations suggesting that the present shortage can be a temporary problem, while it has been suggested to investigate if less pure heavy gasses are available and if more refined gas system can overcome the purity limitations. A suggested approach is to contact the LHC experiments with detectors that make use of heavy gasses to investigate their strategy to deal with this issue.

Progress in accessing and overcoming this critical aspect should come from the contributions of the microR-WELL groups, the tracking CC-WG conveners, the Project and SP-Office.

3) Readout of the long trackers forming the outer layer.

It has been proposed to read-out from one single end of the tracker by coupling the FEE with the strip edges far from the readout electronics via long coaxial cables. Concerns about this approach were put forward in the talk dedicated to the FEE ASIC SALSA, specifically the substantial capacitance due to cables. Fernando Barbosa has kindly agreed to further investigate this potential problem.

Best regards,  
Silvia

--

Silvia DALLA TORRE

<http://wwwusers.ts.infn.it/~dallator/SilviaDALLATORRE/>

INFN - Sezione di Trieste

<http://www.ts.infn.it>

Via Valerio, 2

34127 Trieste ITALY

tel. +39.040.558 3360 - +39.040.375 6227

fax +39.040.558 3350 - +39.040.375 6258

e-mail: [silvia.dallatorre@ts.infn.it](mailto:silvia.dallatorre@ts.infn.it)