

Subject: TIC meeting , September 9, 2024 (TDR effort, progress (FB); background studies; dRICH gas system) - main outcome

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

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To: elke-caroline aschenauer <elke@bnl.gov>, Simon Gardner <simon.gardner@glasgow.ac.uk>, Nathaly Santiesteban <nathaly.santiesteban@unh.edu>, thomas ullrich <thomas.ullrich@bnl.gov>, Ernst Sichtermann <EPSichtermann@lbl.gov>, Oleg Tsai <tsai@physics.ucla.edu>, "Landgraf, Jeffery M." <jml@bnl.gov>, Barbosa Fernando <barbosa@jlab.org>, "jhuang@bnl.gov" <jhuang@bnl.gov>, "eic-projdet-tic-l@lists.bnl.gov" <eic-projdet-tic-l@lists.bnl.gov>, Barak Schmookler <baraks@ucr.edu>, "tamponi@to.infn.it" <tamponi@to.infn.it>
CC: "Lajoie, John" <lajoiejg@ornl.gov>, matt posik <posik@temple.edu>, "Hartbrich, Oskar" <hartbricho@ornl.gov>, "Garg, Prakhar" <prakhar.garg@yale.edu>

Dear Colleagues,

this e-mail is to underline the main outcomes of the September 9 TIC meeting, dedicated to (i) TDR effort, progress (FB-luminosity), (ii) background studies and (iii) the dRICH gas system.

The reports, carefully prepared by the speakers, have been greatly appreciated.

Communications on September 9:

- from TC-office: Two replacements in DSC management: in Luminosity DSC, Stephen Kay steps in as

DSTC for the PS, replacing Dhevan Gangadharan; in the Barrel ECAL, Manoj Jadhav replaces Jessica Metcalfe

as DSTC for the Astropix sector. A warm thank you to Dhevan and Jessica; welcome, Stephen and Manoj.

- from DSCs: Barrel HCal is interested in ordering approximately 120 SiPMs

(https://www.hamamatsu.com/us/en/product/optical-sensors/mppc/mppc_array/S14160-3015PS.html)

and wanted to check if others were planning a similar order that we might be able to combine with to be more cost effective.

- From CC WGs: electronics/R-O-DAQ WG makes precise proposal about how sharing electronics information in the TDR.

About data Volumes: each subsystem describes its specific aspects, while the summary divided by components/ASIC formats are discussed in the DAQ subsection.

About FEEs and RDOs, specific aspects as well as the sensor performance couple with its FEE are presented

in the subsystem subsections, while the ASIC description and the common RDO features are included in the electronics subsection.

(i) TDR effort, progress: FB-luminosity

The update reports on the Pair Spectrometer activity, with relevant progress in:

- Lumi Integration;

- The procurement of the materials for a calorimeter prototype and the module moulds, the fiber holders and the procedure for fiber filling;

- The arrangement of the readout at the calorimeter units.

(ii) background studies: **Synchrotron Radiation Studies in the EIC Experiment.**

A rich and complete report illustrated:

- The original steps forward in the SR simulation tool meant to save in computing time and whose reliability has been crosschecked versus already established software tools.

In general, these studies have severe requirements in term of computation resources.

- The Background Estimation in ePIC: the SR rates in the Central Detector region can decrease up to 3 orders of magnitude introducing SR masks. At the current stage of the simulation,

with implemented masks, the SR background rates in the ePIC tracking system are of the order of 100 MHz at 18 GeV and 0.227 A.

These studies have put in evidence

a mismatch between the present design of the beam pipes and their implementation in DD4hep.

- Miscellaneous Studies: An alternative to SR masks are Ante-chambers, whose performance has been simulated.

B2eR (outgoing electron beam line) relocation (Cold → Warm) has been studied to appreciate the advantages

of possible new layouts for the luminosity window and the kinematic coverage of the low Q^2 taggers.

(iii) The dRICH gas system

The baseline radiator gas C₂F₆ has been selected following the requirements for physics.

The basic scheme of the gas system , based on the experience of the COMPASS RICH has been presented,

underlining the differences related to the properties of the gas and the need

to avoid the release of greenhouse gasses in the atmosphere. One of the main

challenges is the separation C₂F₆ /nitrogen required when filling the vessel and when recovering the gas.

Distillation is challenging due to the very low temperature of the C₂F₆ boiling point and the option of using membranes is under consideration and requires dedicated studies.

If this notes need corrections/integration, please, write me back.

Thank you.

Best greetings, Silvia

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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