Subject: Strategy emerging from the TIC meeting on August 7 dedicated to HGCROC and EICROC
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Dear Colleagues,

         The TIC meeting on August 7 dedicated to "summarizing HGCROC and EICROC requirements" was very productive, thanks to the two previous meetings dedicated to HGCROC (July 10) and EICROC (July 17) and to the careful reports by Norbert Novitzky and Fernando Barbosa.

As you may recall, the goal of this exercise was to identify where a common ASIC may be appropriate, and to provide a set of requirements to the Omega Group for the HGCROC, H2GCROC and EICROC. Based on the information received in the TIC meetings and the discussions with the CC WG conveners and Project representative, we have settled on the following strategy:

1) Calorimetry

Taken together, the requirements of the Forward HCal + insert, Barrel HCal, Barrel EMCal, and Backward HCAL are very similar and a single ASIC (H2GCROC) can meet the requirements for these systems. A superset of requirements should be developed from the most demanding detector system in this category, and these requirements passed along to the Omega Group designers to explore development of a cost-effective version of the H2GCROC with minimal modifications.

The backwards EMCal aims at very fine performance, in particular with a very small constant term. This can be difficult to obtain with a dedicated ASIC, especially with multiple SiPMs ganged together. At the same time, this system has a limited number of channels, and therefore a readout chain designed around discrete elements (COTS) with the required performance is a reasonable approach. The backward EMCal should proceed to developed such a design based on the ongoing work in eRD109.

The forward EMCal requirements also aim at a small constant term with a large dynamic range of shower energies, but is a larger system with a large number of channels. The forward EMCal should explore both options, namely the usage of H2GCROC with the parameters dictated by the subset of the calorimeter subsystems in ePIC (described above) and a read-out chain based on COTS following the developments in eRD109.

2a) AC-LGAD Pixel sensors

The AC-LGAD sensors foreseen in the Roman Pots, Off-Momentum Detectors, B0 trackers and forward ToF layer have similar characteristics, and the requirements for these systems seem to be a good potential match to the EICROC. The list of requirements for these detectors should be completed by the detector groups (most importantly the capacitance, the charge min and max, and the expected rate) and communicated to the EICROC designers for development of a cost-effective version of the EICROC with minimal modifications.

2b) AC-LGAD Strip sensors

The strip nature of these sensors will require a different version of the EICROC, where the mean difference has been identified in the layout and implementation of the input electrodes. A modified version of the EICROCx can be considered or, as interesting

alternative, the ASIC
FCFDv2 (eRD109). Additional work will be required to determine the optimal approach in
this case.

2c) HRPPD and MCP-PMT detectors

These sensors will required a dedicated version of the current HGCROC (note this is the
existing HGCROC, not the SiPM-focused H2GCROC); the
FCFDv2 is also a potential option. Additional work will be required to determine the
optimal approach in this case.

Best Regards,
Silvia, John

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