

Subject: TIC meeting 11/6 , 2023 (EIC R&D for 2024; ZDC: requirements, radiation dose, updates) - main outcome

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Dear Colleagues,

the meeting has been characterized by rich information, very well presented by speakers and lively discussions.

Main findings:

The report about the outcomes of the calls for the EIC R&D program and the generic EIC R&D program have been summarized to provide shared information to TIC members.

Relevant progress in addressing the ZDC matter has been registered.

- The requirements have been reviewed and it has been underlined that good space resolution both for photons and for neutrons is also needed, a requirement that received less attention in the past.

- Previous studies of ZDC radiation dose have been presented. Fluka had been used and the approach had been cross-checked with HERA data. The assumptions for the layout at EIC are not up-to-date. The old estimation indicates a peak neutron fluence near $10^{13}/\text{cm}^2/\text{y}$.

- Updated radiation dose evaluation using up-to-date machine and ePIC detector configurations have been illustrated. Using the present layout baseline and two different software approaches (Geant3 and GCALOR; Geant3 and FLUKA) the fluence is in the range $0.5-1.2 \times 10^{12}/\text{cm}^2/\text{y}$. Further reduction can be obtained modifying the ZDC structure, as non negligible contribution to the fluence is generated by the calorimeter material itself.

- An update of the performance of ZDC SiPM-on-tile has been provided, including a proposed LYSO + Fe/Sc calorimeter combination, with indications that it meets all the ZDC requirements.

As usual, if this notes need corrections/integration, please, write me back.

Thank you.

Best greetings, Silvia

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