Synchrotron Radiation in Direct Photon Detector
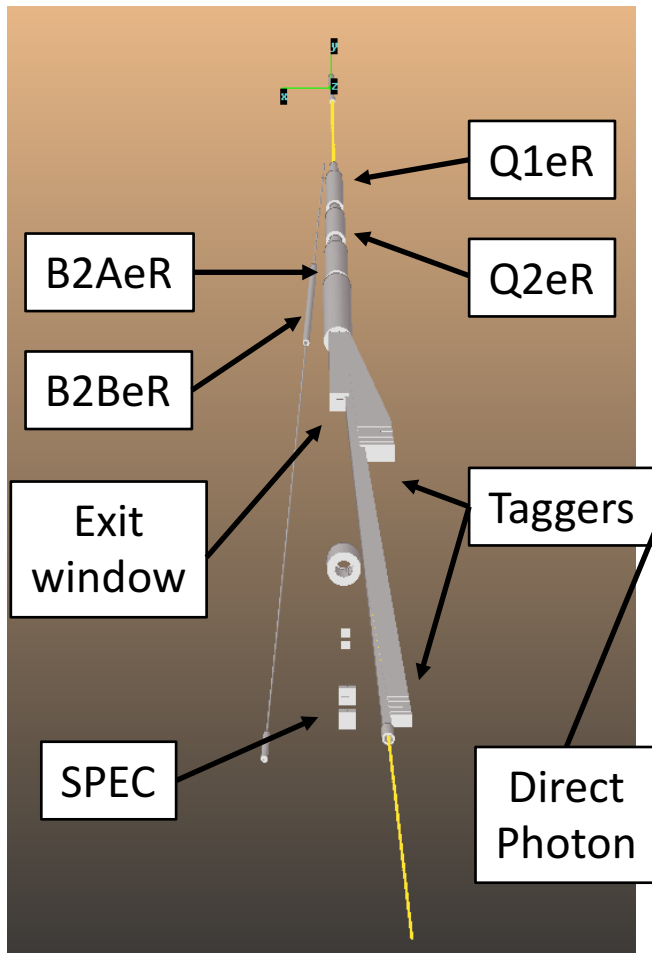
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1. AGH University of Science and Technology, Krakow
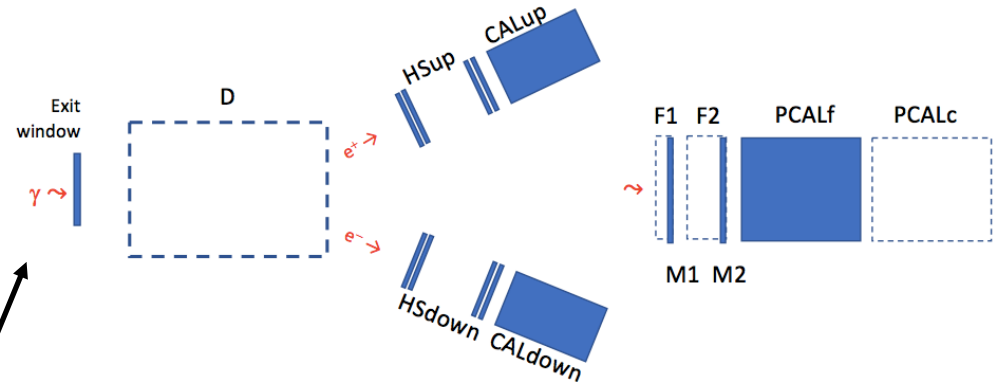
2. Temple University, Philadelphia

Recap

Far backward Geometry

Q1eR

Q2eR

B2AeR

B2BeR

Exit window

Taggers

SPEC

Direct Photon

Geom generated in the standard EIC framework and imported to SynRad+


- Objectives
  - We aim to study distributions of energy deposited by bremsstrahlung, for various detector types and configurations (Anna, Yasir)
  - Study the SR dosage on the photon calorimeters & other sensitive components in the far backward region.
  - Provide constraints for the SR shielding for the photon detector in terms of the shielding properties and performance and detection efficiency.
  - Quantify the damage due to SR on these components.

Status
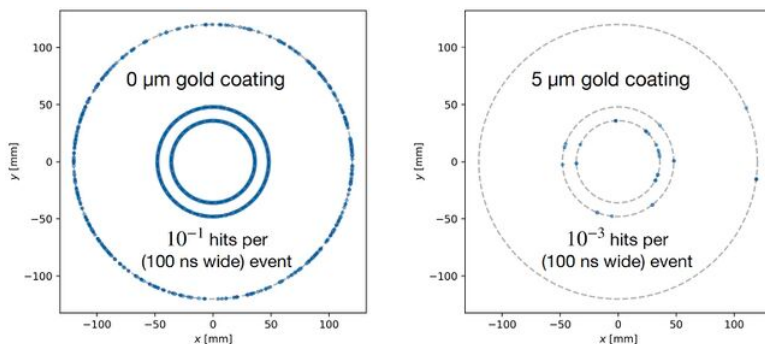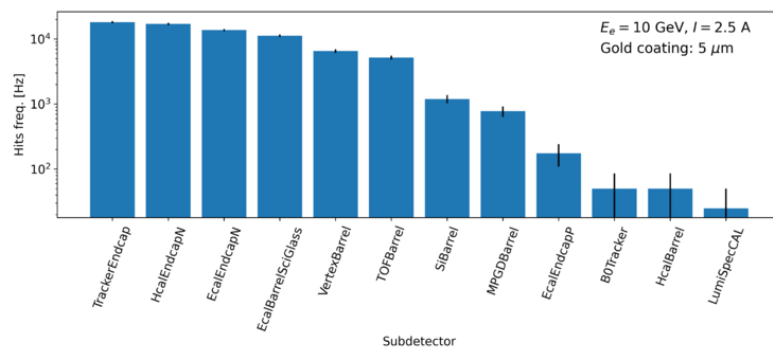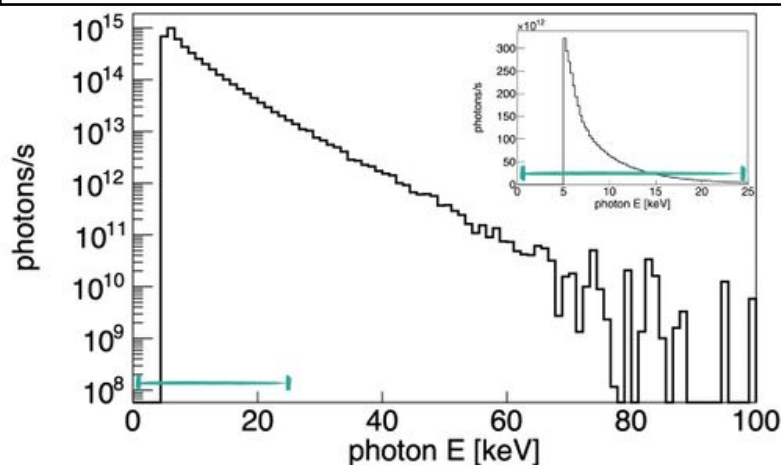
- Accurate modeling of the accelerator & beam properties

  - SR simulation already produced from the accelerator group (https://indico.bnl.gov/event/10974/contributions/51260/).
  But this sample only simulates photons originating from the magnets in the forward region.
  → Used for studies of central detector components.
  (https://wiki.bnl.gov/EPIC/index.php?title=Background)
  → Features E_e = 10 GeV, whereas we expect to see much higher SR activity with E_e = 18 GeV collisions.

  - Similar simulation work, but focused on the far-backward components, will be a key contribution to this study.

  - BNL is in the process of a new hiring for this simulation tasks.