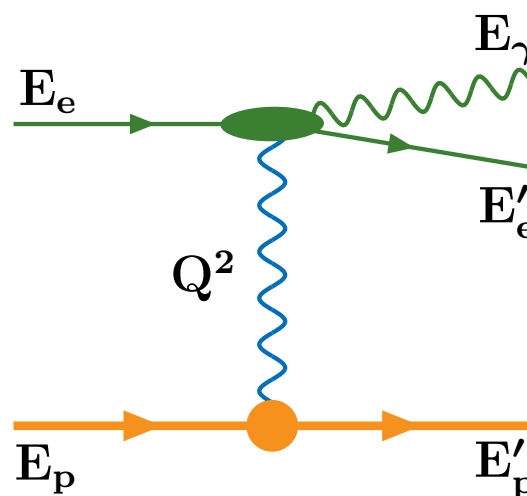
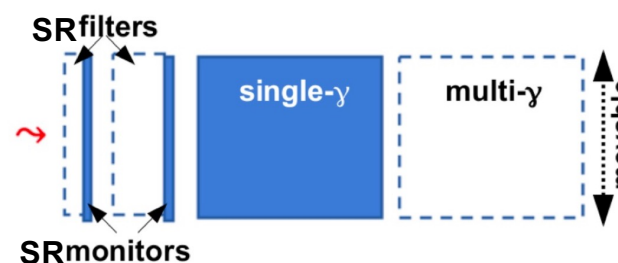
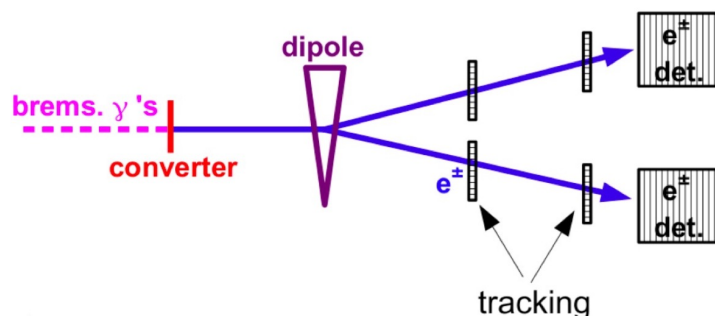


# Luminosity Monte Carlo development plans

Krzysztof PIOTRZKOWSKI



# Motivation & priorities

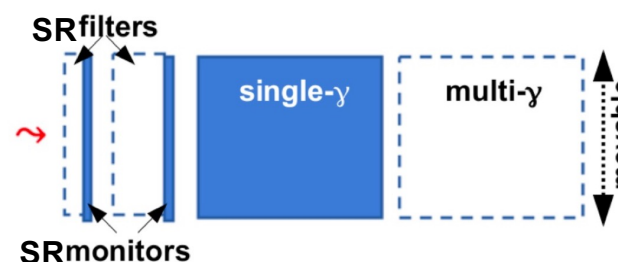
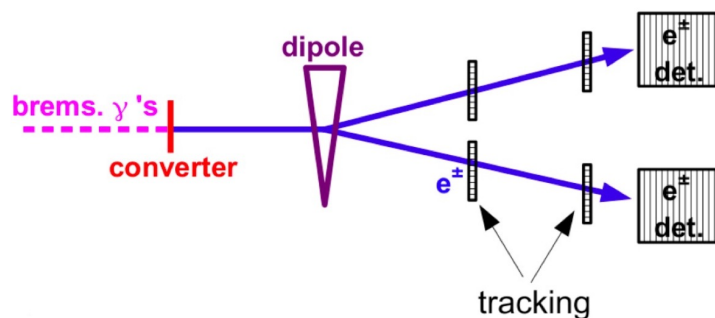


**The problem** of making progress with the FB detector designs/technology developments:

- FB “environmental conditions” are not well understood yet especially for the direct photon and low- $Q^2$  electron measurements:  
extreme bremsstrahlung ( $eAu!$ ) event rates resulting in huge irradiations + need of direct and secondary SR attenuation/masking

⇒ Our priority now is, using the most up-to-date beamline geometry in Geant as well as the EIC beam parameters, simulate all relevant FB energy depositions due to bremsstrahlung and SR

## Plans & resources



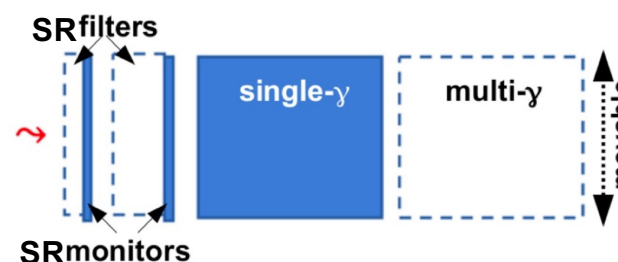
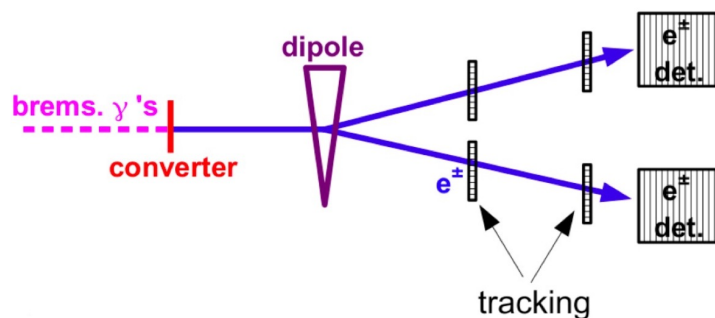
### Our tentative plan (in priority order):

- Make two types of simple detector mock-ups with 3D grids for simulated energy depositions:  
1. Homogenous (crystal) calorimeter and 2. SciF/fused silica spaghetti one
- Calculate bremsstrahlung energy depositions at the nominal luminosity
- Study direct SR attenuation at various electron beam energies for a couple of SR filter thicknesses
- Study effects of bremsstrahlung event pileup at the nominal luminosity
- Study indirect SR background in electron detectors, at various electron beam energies

⇒ Manpower/resources:

AGH UST – Anna Kowalewska, PD (50%) starting Oct 1, and another PD (30%) starting Jan 1, 2023  
Temple U. – one PD + phd student (in a year)

## Remarks



- Of course, we count on a wider collaboration/use of already existing simulation models/developments  
⇒ need for coordination – dedicated FB WG meeting?
- asap we should include such studies/developments in the ePIC DWG task lists, see ⇒ <https://indico.bnl.gov/event/16034/contributions/63766/attachments/42860/71947/EIC-EPIC-WGConveners-08192022.pdf>
- most of the team members are newcomers to the EIC business ⇒ need for extensive contacts/tutorials/intro materials etc. – a dedicated wiki page?

STAY TUNED