

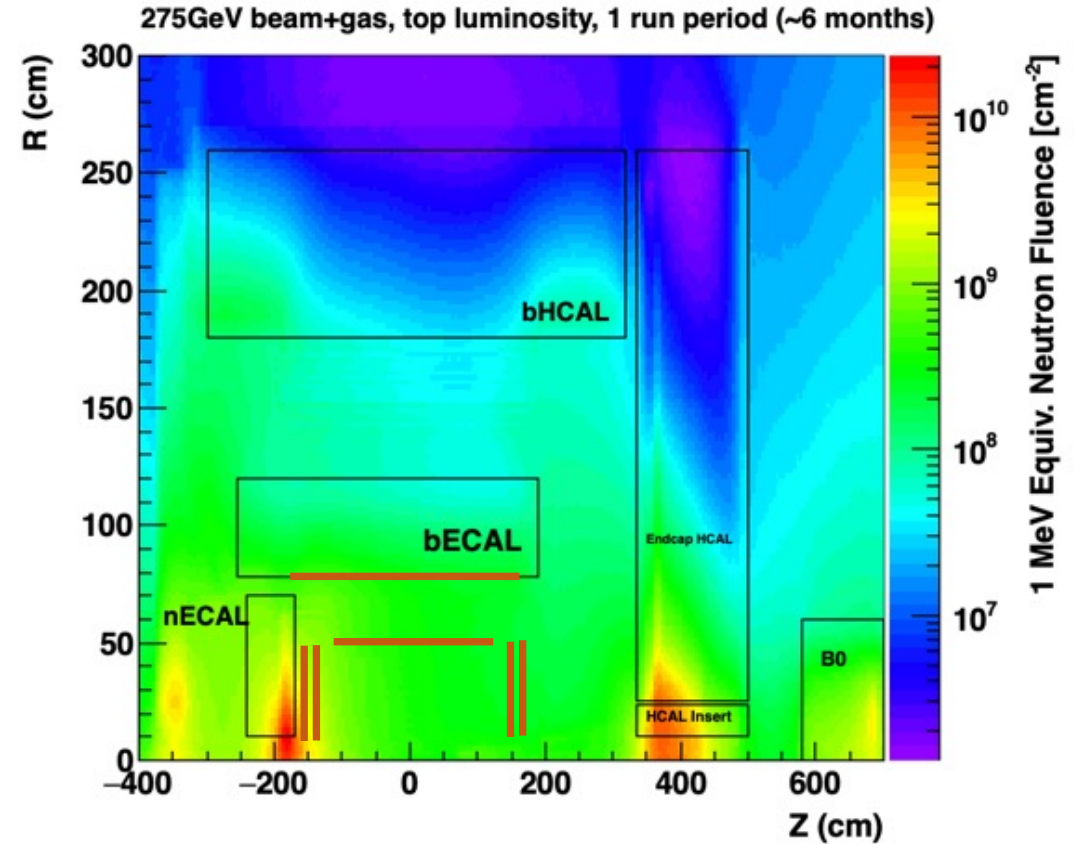
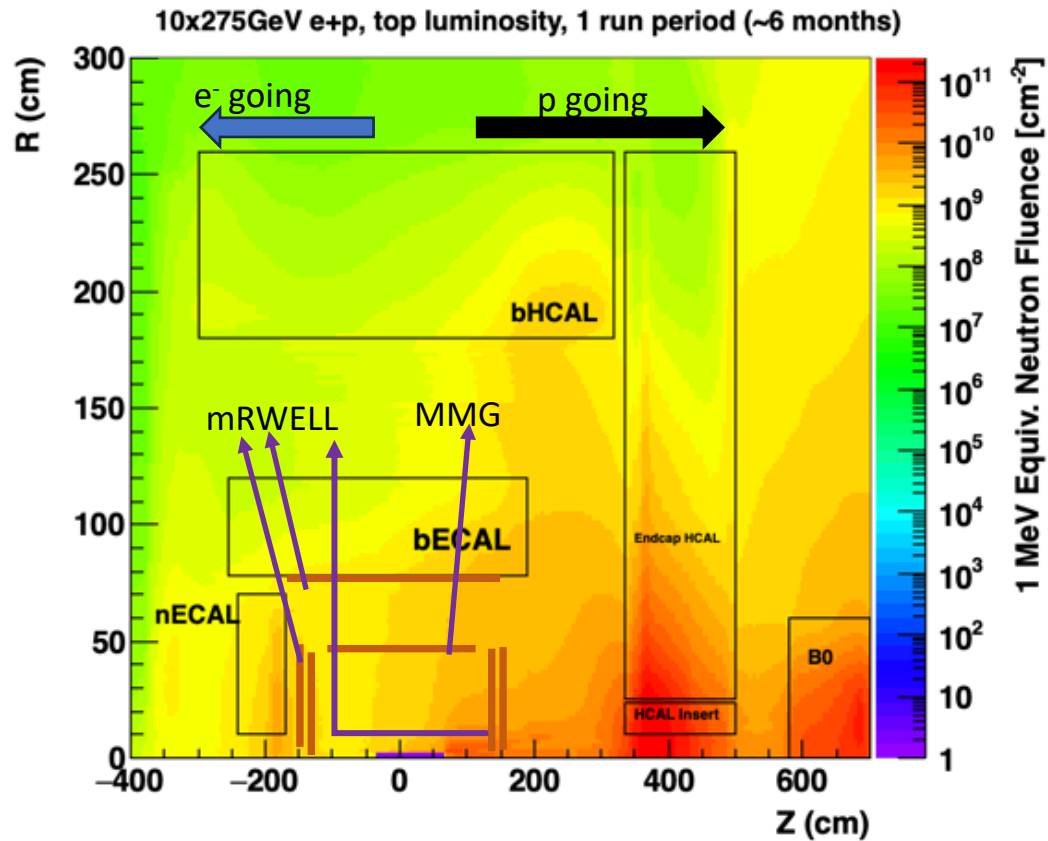
# MPGD tracker radiation dose

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# Radiation dose at MPGD trackers @ 100% det efficiency

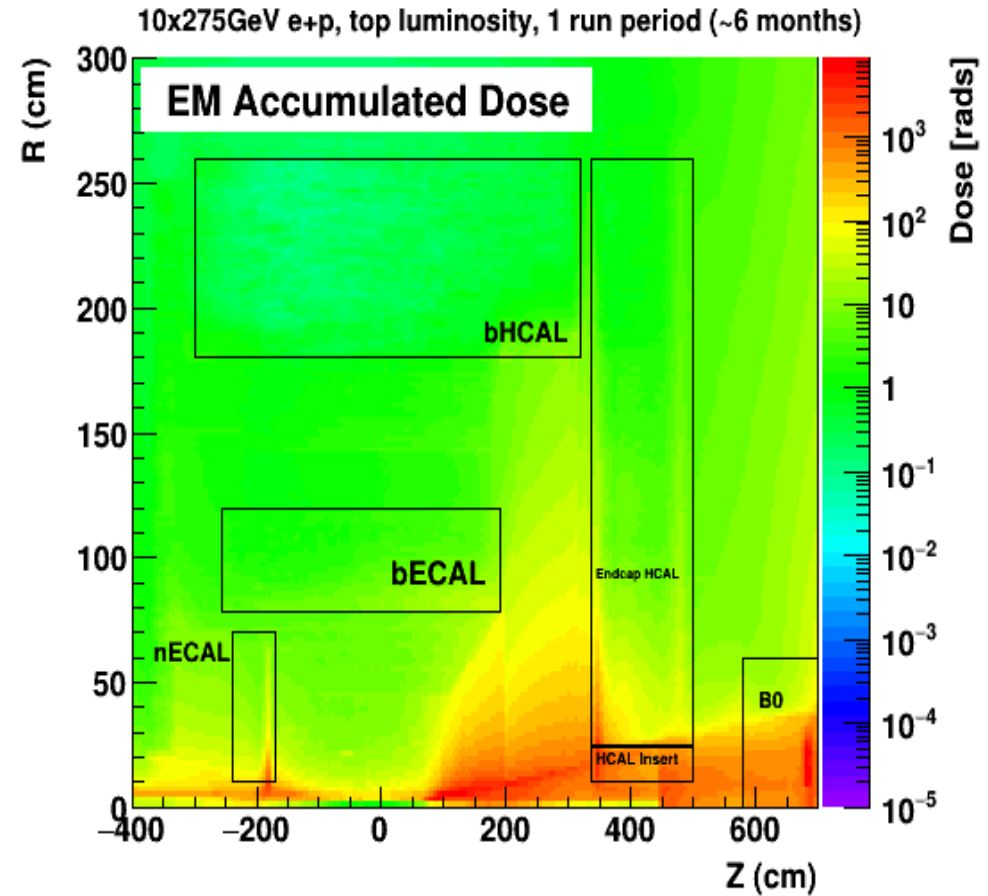
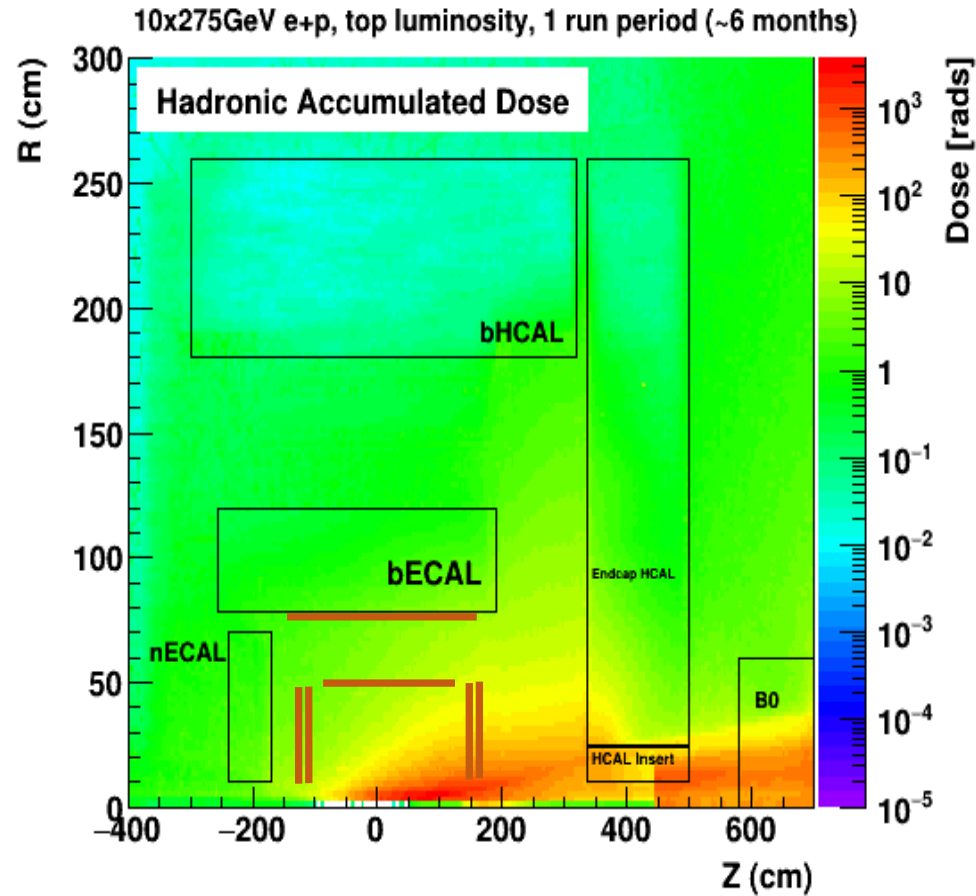
Ref: [https://wiki.bnl.gov/EPIC/index.php?title=Radiation\\_Doses](https://wiki.bnl.gov/EPIC/index.php?title=Radiation_Doses)



MPGD layers	1 MeV neutrons equivalent fluence (6 months e+p)	1 MeV neutron equivalent (6 months beam+gas)
Barrel mRwell @ R ~ 70 cm	$\sim 1.3 \times 10^9/\text{cm}^2 - 4 \times 10^9/\text{cm}^2$	$\sim 3.4 \times 10^8/\text{cm}^2$
Barrel MMG @ R ~ 50 cm	$\sim 1.3 \times 10^9/\text{cm}^2 - 4 \times 10^9/\text{cm}^2$	$\sim 3.6 \times 10^8/\text{cm}^2$
mRwell @ z ~ 160 cm	$\sim 4 \times 10^9/\text{cm}^2 - 1 \times 10^{10}/\text{cm}^2$	$\sim 3.0 \times 10^8/\text{cm}^2$
mRwell @ z ~ -140 cm	$\sim 1.3 \times 10^9/\text{cm}^2$	$\sim 4.0 \times 10^{10}/\text{cm}^2$

# Radiation dose at MPGD trackers @ 100% det efficiency

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MPGD layers	Radiation dose (6 months e+p)	Radiation dose (6 months beam+gas)
Barrel mRwell @ R ~ 70 cm	~ 4 rads	~ 7.0 rads
Barrel MMG @ R ~ 50 cm	~ 9 rad	~ 7.0 rads
mRwell @ z ~ 160 cm	~21-31 rads	~ 40-60 rads
mRwell @ z ~ - 140 cm	~ 1.0 rad	~ 10 rads

# Conclusions :

- Neutron fluence (1MeV equivalent) and radiation dose higher from beam gas in electron going direction.
- Simulations done for e+p only. Need to look at e+A .
- Energy of e- was set @ 10 GeV in the simulations, collider target is to go upto 18 GeV (TABLE 3.3 in EIC CDR) . Need to look at dose at this energy especially from beam gas.
- Electronics group probably should also consider radiation dose at ITS3 locations for MPGD FECs in case MPGDs replaces ITS3.