EIC and radiation levels

neutron flux above 100.0 keV in [n/cm²] for 1.0 fb⁻¹ integrated luminosity

Yellow Report
beam-beam interactions only

Radial coordinate, [cm]

Z coordinate (along the beam line), [cm]
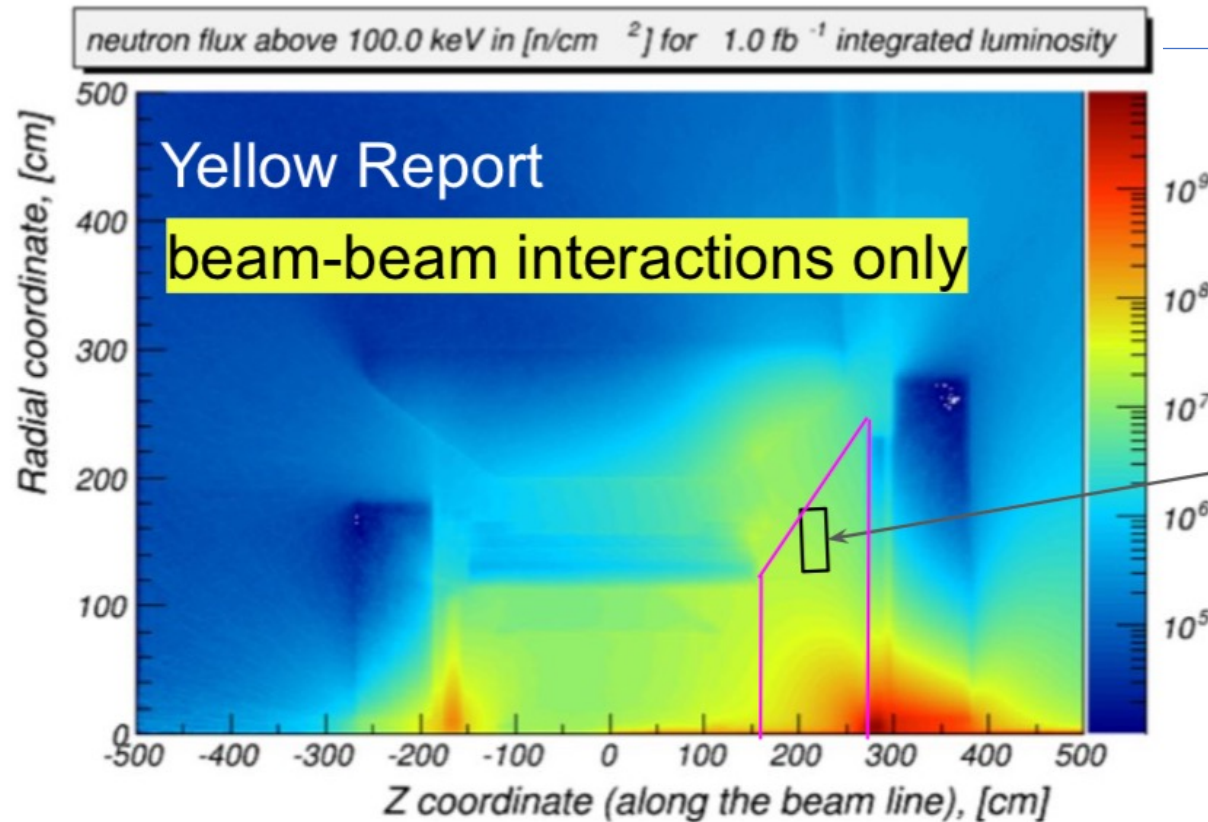
having as target 100 fb⁻¹ (several years at maximum luminosity) this brings
10^{11} n/cm² 1 MeV-neq as "maximum"
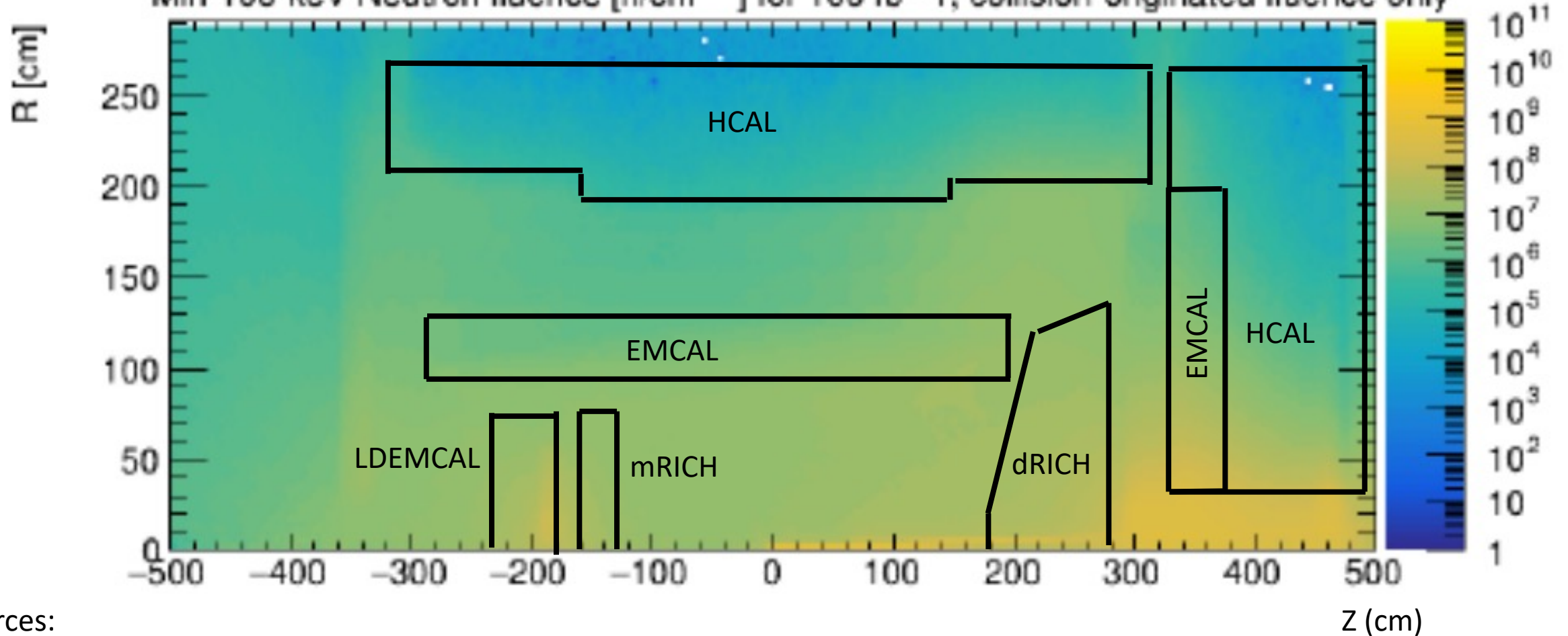- 10 fb⁻¹ in 30 weeks of operations at 10^{34} s⁻¹cm²
- 100 fb⁻¹ in 10 years → 1.5 10^9 n/cm²

potential location of sensors in ATHENA design. To be revised in ECCE (180<z<280) but order of magnitude will not change.
≈ 1.5 10^7 n/cm² (100 keV ≈1 MeV-eq) every 1 fb⁻¹

Foreseen radiation levels allow one to consider solutions already available on the market + strategy to mitigate the radiation damages

ECCE radiation levels

ECCE Simulation, e+p, 20+250 GeV/c, Pythia6 50 μb total x-sec.

Min-100-keV Neutron fluence [n/cm^2] for 100 fb^-1, collision-originated fluence only