GEANT4 and MCNP Simulation Validation

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Goals of comparison

1. Validate results are the same for both GEANT4 and MCNP6
2. Have macros ready to perform case study comparisons for users of GEANT4 and MCNP
   a. Particularly useful when changing which version of a software is being used
3. This arsenal will continue to be developed
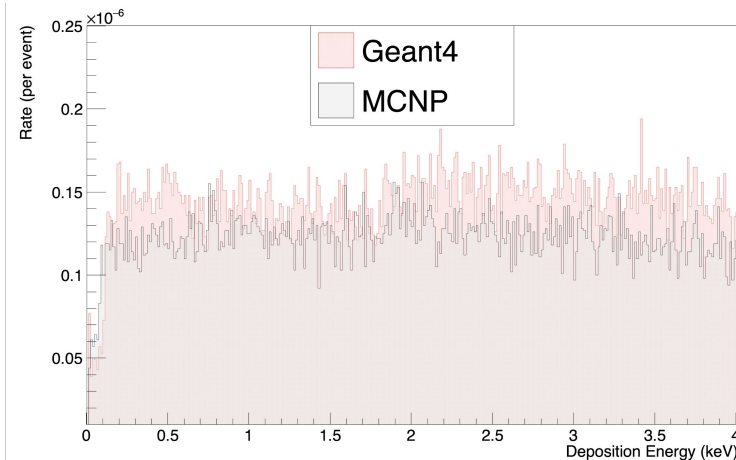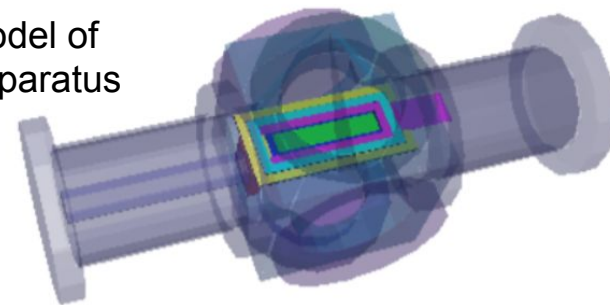
Electron and photon physics

We use the experimental apparatus at UChicago
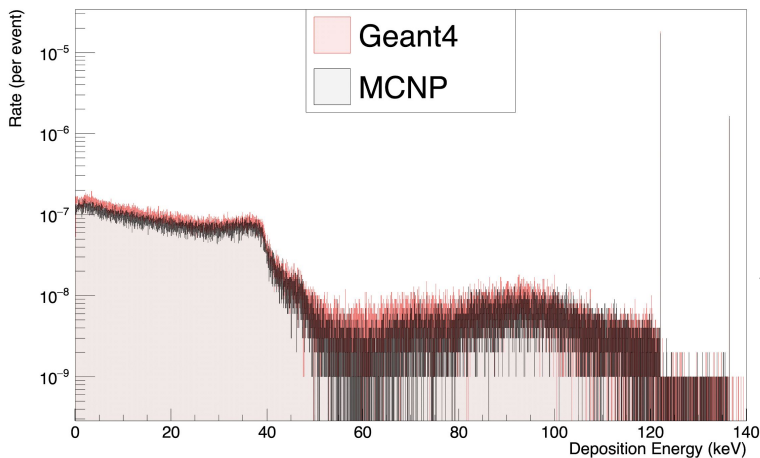
Model of apparatus

Energy spectrum (including compton spectrum) from Co-57 source
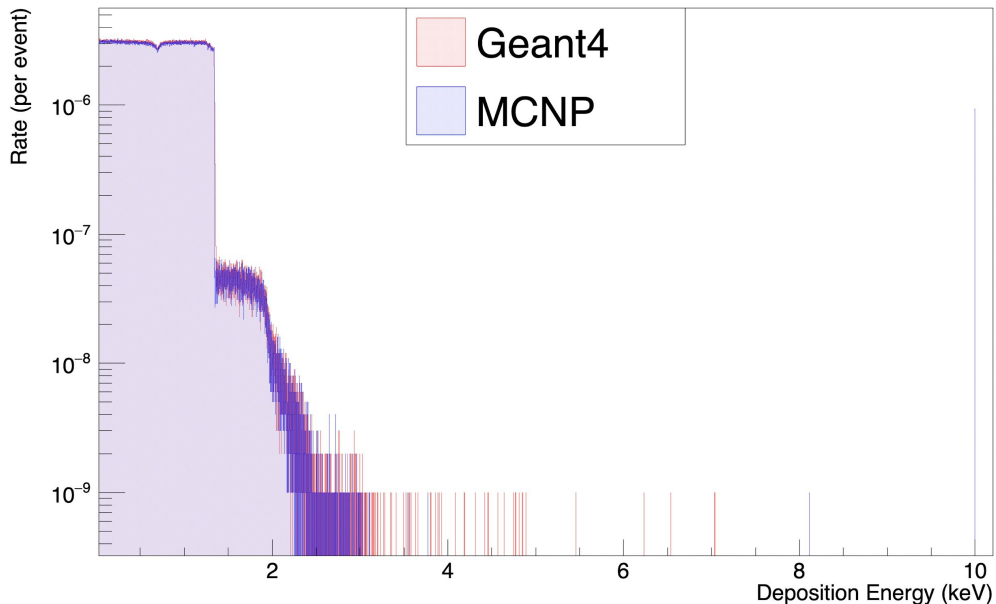
Rate difference due to source placement

Can see K-step rise near 2 keV
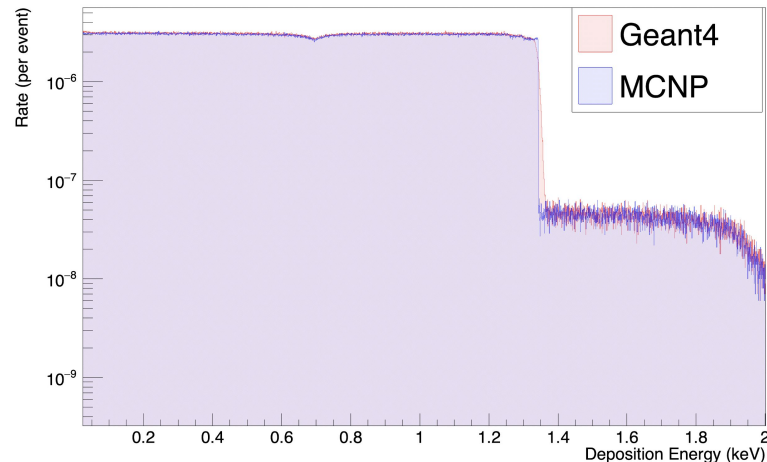**In the future, comparisons with other sources (e.g. Am-241)**

Neutron physics

Need to fully understand difference in handling of elastic scattering (MCNP has sharper cutoff):

In the future, comparisons with shielding:

Monoenergetic neutron source with CCD

MCNP records energy of captured neutron, whereas G4 records emitted EM energy

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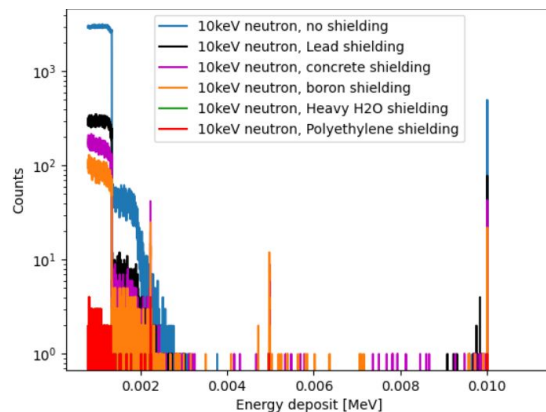
Validation arsenal

GEANT4 and MCNP6 macros that can be used out-of-the-box, including run instructions, **will** be on **GitLab** soon. Information will be located at:

https://gitlab.in2p3.fr/damicm/DAMICM_G4Sims/-/wikis/G4-validation-plots