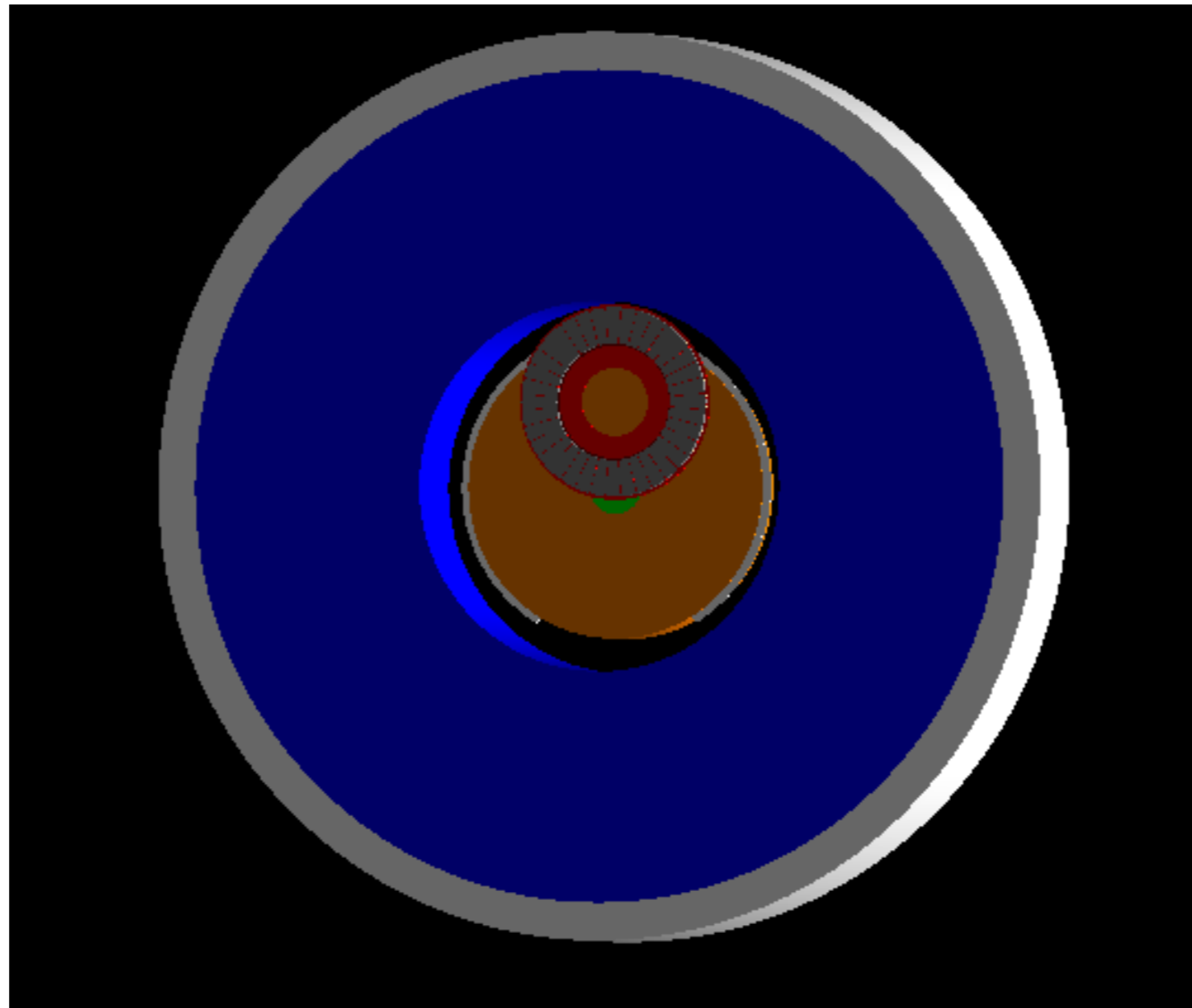


Update on ESS Geant4 Studies

Current status of code

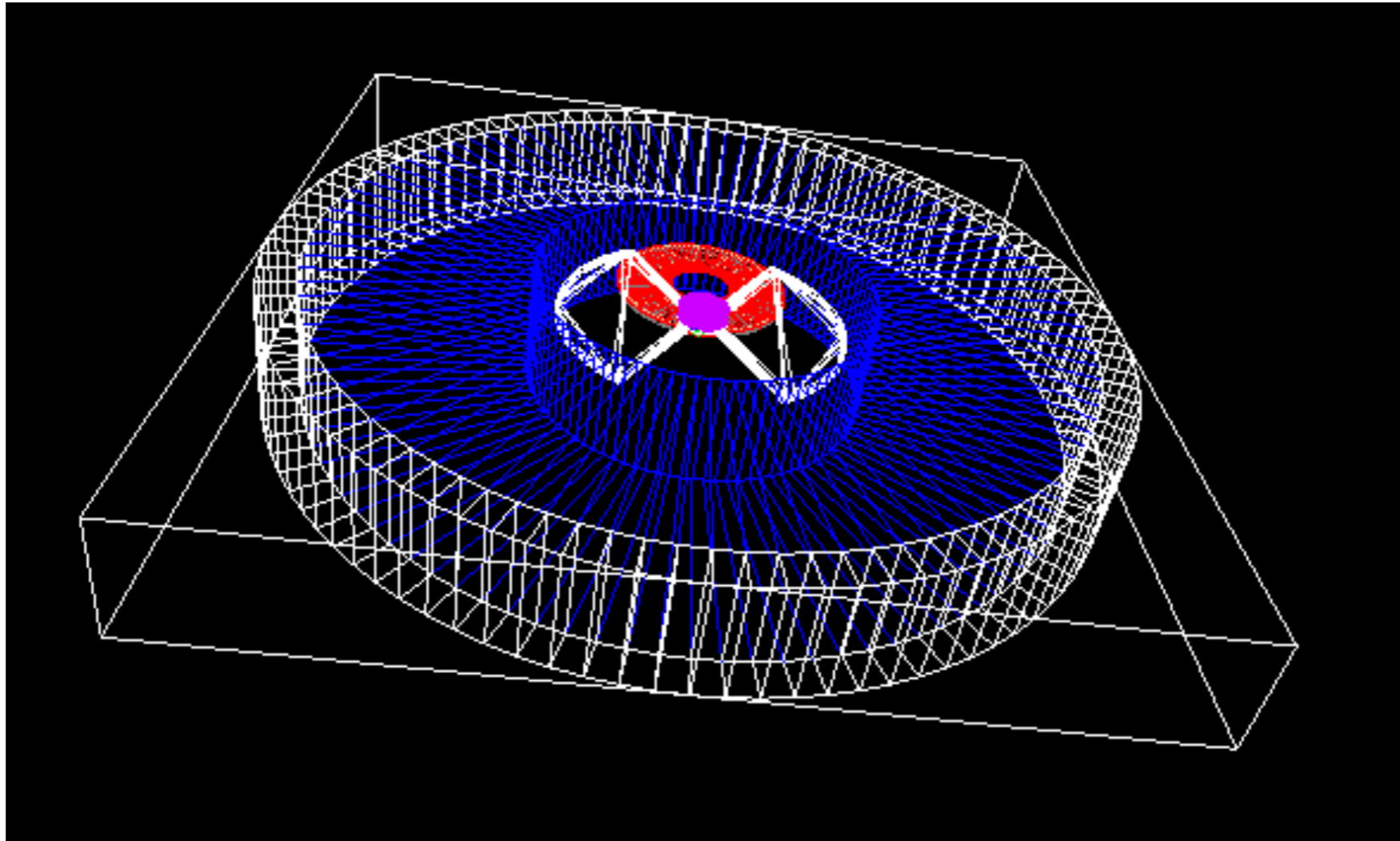
- **Github:** <https://github.com/ESSNeutronSimulations/essneutrons>
- This is a combination of:
 - ESS geometry from Mostafa:
<https://github.com/ESSNeutronSimulations/MostafaGeant4Code>
 - Weight-windowing code from Douglas:
<https://github.com/ESSNeutronSimulations/WeightWindowCode>

ESS geometry



- **In addition to geometry set up by Mostafa:**
 - Steel cylinder surrounding target+moderator, extending out to 5.5 m in radius
 - Concrete layer extending 0.5 m beyond the steel cylinder

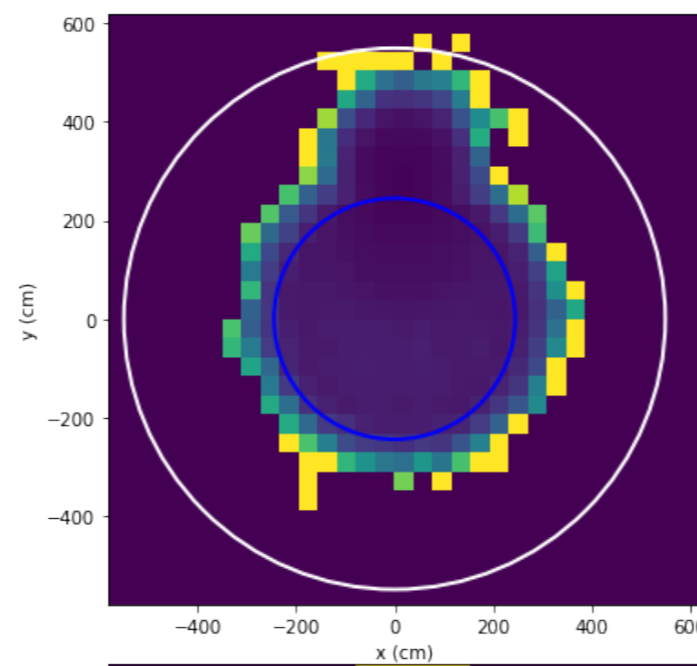
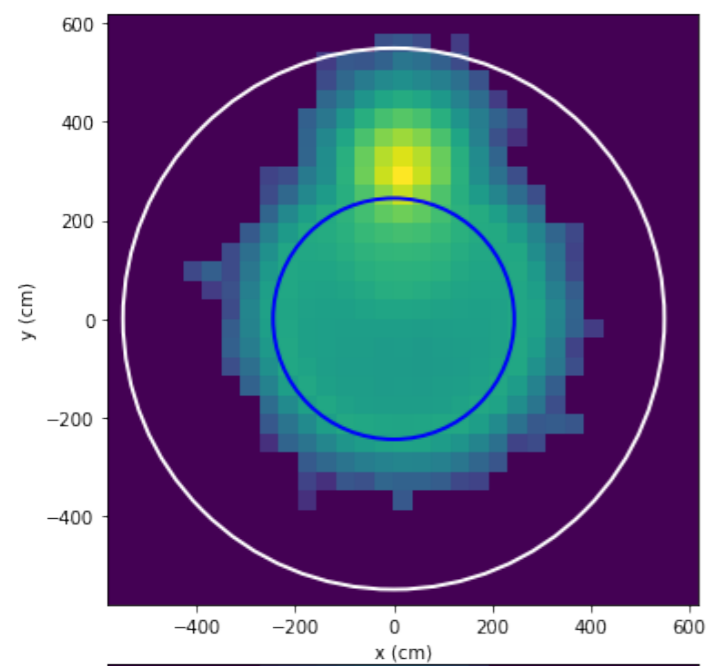
Neutron flux simulations



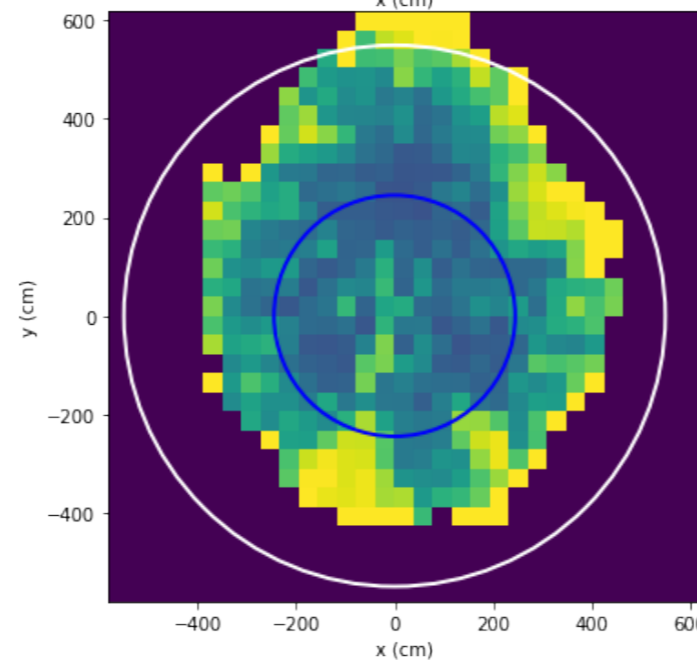
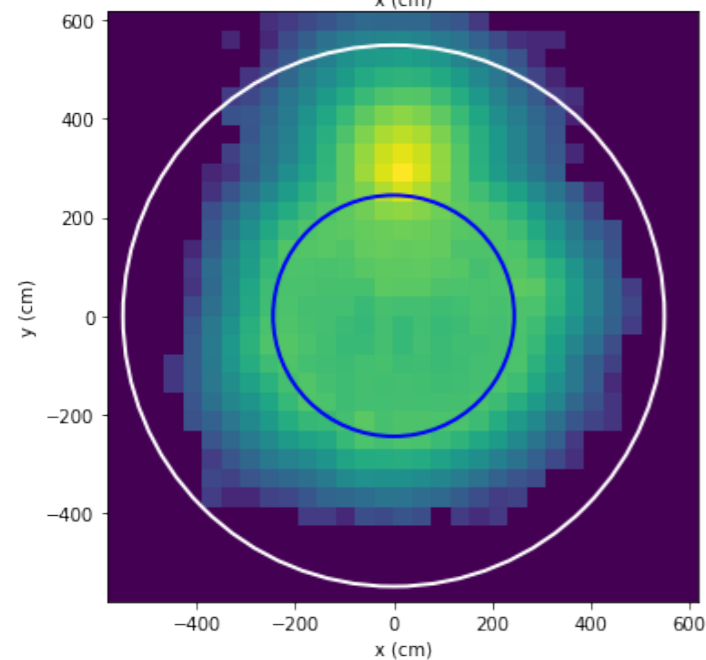
- Volume divided into $31 \times 31 \times 31$ grid on which weight-windowing is performed

Neutron flux simulations

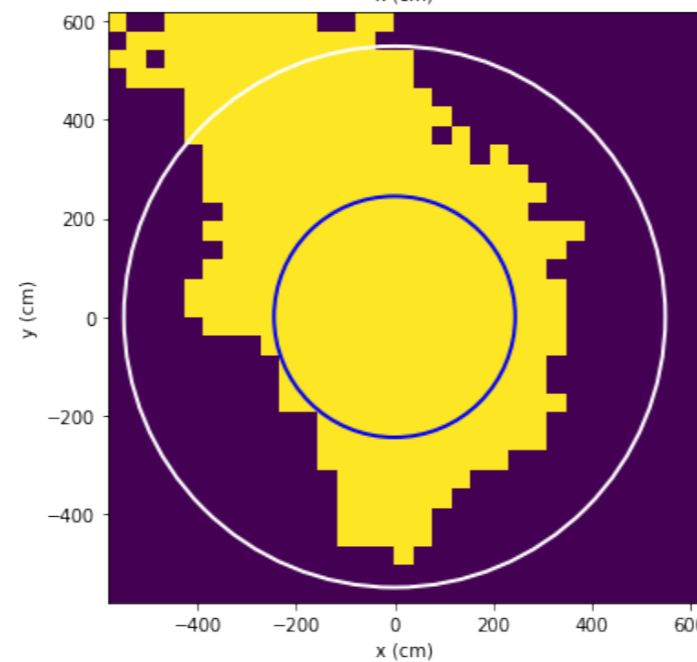
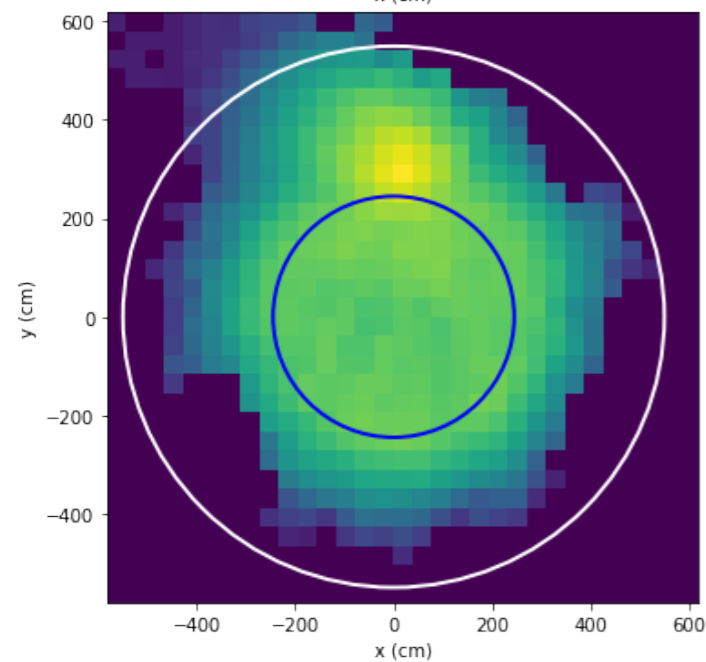
- 2 GeV protons incident on the tungsten target
- Neutron flux computed over the grid: plane with maximum flux shown for initial flux computation + 2 iterations



Initial run



Iteration 1



Iteration 2

Next steps

- Optimization of the flux simulation (suggestions from Douglas)
 - Change grid dimensions
 - Stop tracking low-energy (below 10 MeV) particles leaving the target
 - Cylindrical cells
 - Varying monolith density over iterations
- Run on larger cluster (Helena working on this at DIPPC)
- What changes to the geometry must be made?