1 1D-neutronics

1.1 1D-fuel

- Mesh: *1D-fuel.msh*
- Transient problem.

Figure 1 shows the results.

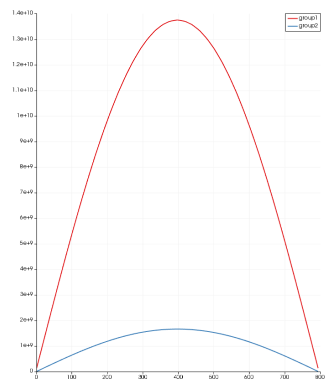


Figure 1: Group 1 and 2 fluxes at 10 msec.

1.2 1D-fuel-action

- Mesh: GeneratedMesh
- Transient problem.

Figure 2 shows the results.

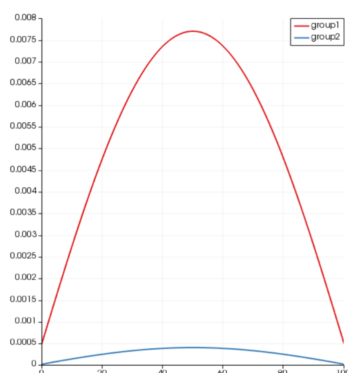
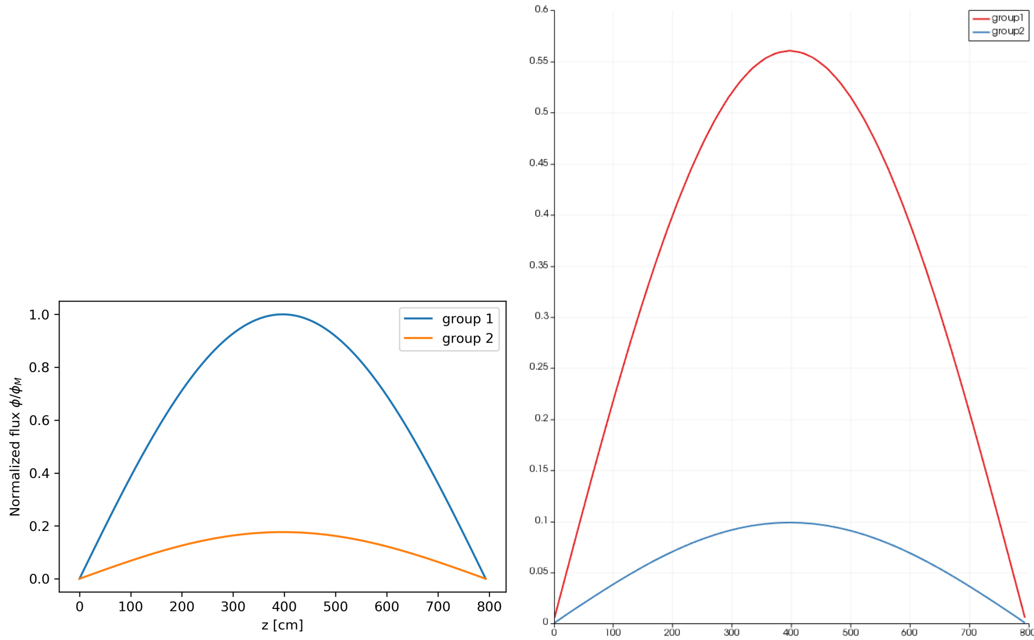


Figure 2: Group 1 and 2 fluxes at 10 msec.

1.3 1D-fuel-eig

- Mesh: *1D-fuel.msh*
- Eigenvalue problem: InversePowerMethod

Figure 3 shows the results. FDM $k_{eff} = 1.415296$. Both fluxes are normalized to the maximum value of the group 1 flux. Moltres: $k_{eff} = 1.415418$.



(a) FDM. (b) Moltres.

Figure 3: Steady state Group 1 and 2 fluxes.

1.4 1D-fuel-reflec

- Mesh: *1D-fuel-reflec.msh*
- Transient problem.

Figure 4 shows the results.

1.5 1D-fuel-reflec-eig

- Input files: *1D-fuel-reflec-eig1.i* and *1D-fuel-reflec-eig2.i*
- Mesh: *1D-fuel-reflec.msh*
- Eigenvalue problem: InversePowerMethod and NonlinearEigen.

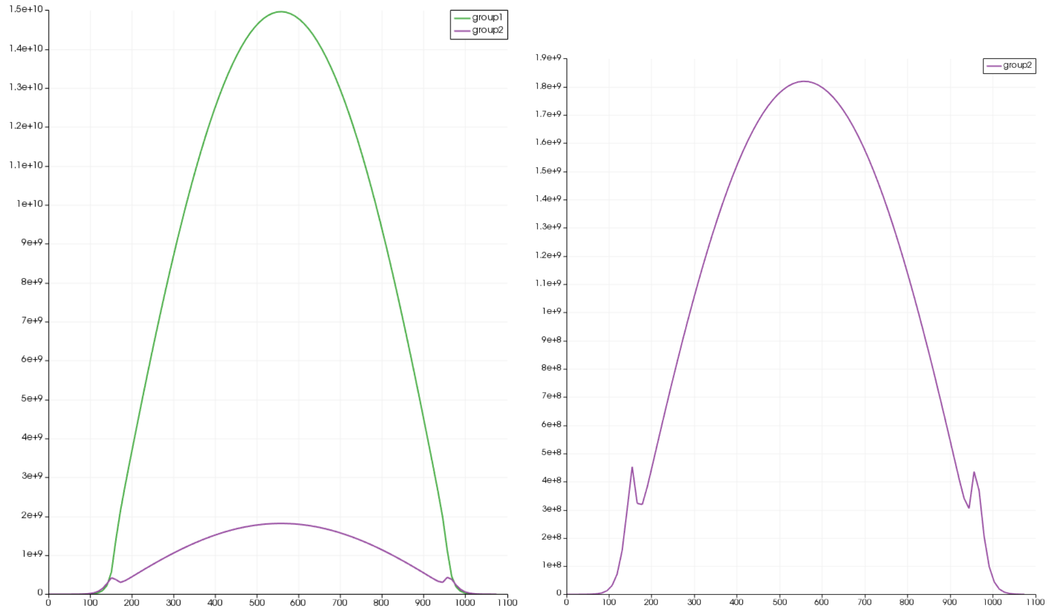
Figures 5 and 6 show the results. FDM $k_{eff} = 1.424280$. Both fluxes are normalized to the maximum value of the group 1 flux. Moltres:

- Inverse power method $k_{eff} = 1.424621$.
- Non linear eigenvalue method $k_{eff} = 1.424644$.

1.6 1D-assembly-eig

- Mesh: *1D-fuel-reflecA.msh*
- Eigenvalue problem.

Figure 7 shows the results.



(a) Group 1 and 2 fluxes at 10 msec. (b) Group 2 flux at 10 msec.

Figure 4: Transient problem fluxes.

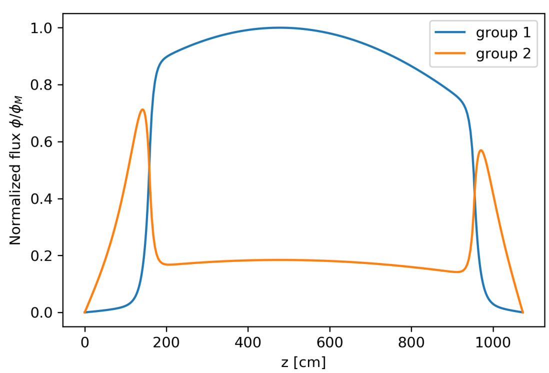
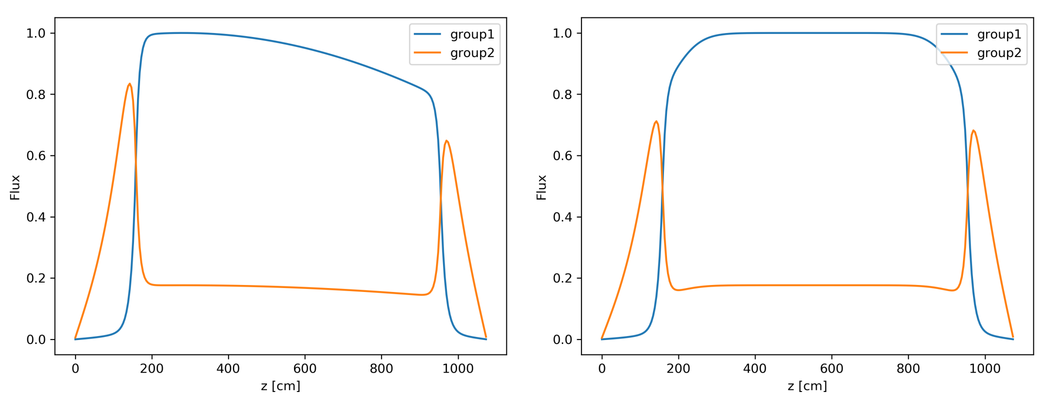
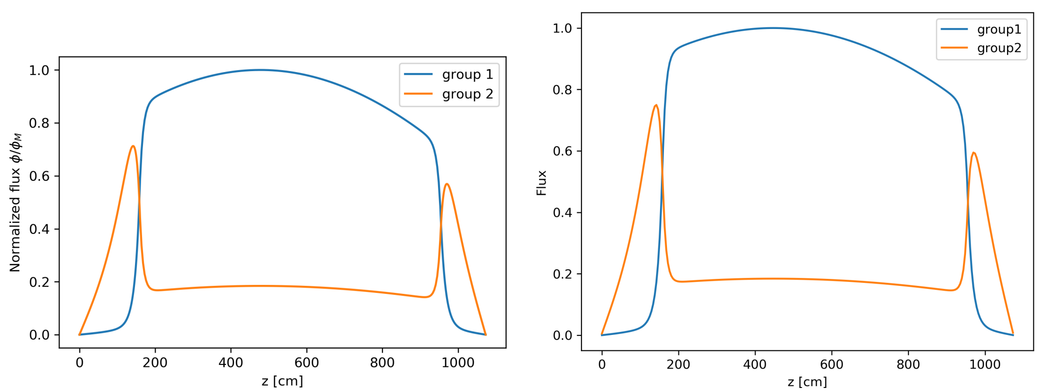


Figure 5: Steady state Group 1 and 2 fluxes using 1D FDM.



(a) Inverse Power Method. (b) Non Linear Eigen.

Figure 6: Steady state Group 1 and 2 fluxes for different eigenvalue iteration methods.



(a) 1D FDM. k_{eff} = 1.407314.

(b) Moltres. k_{eff} = 1.407798.

Figure 7: Steady state Group 1 and 2 fluxes for different methods.