

# 1 1D-neutronics

## 1.1 1D-fuel

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

Figure 1 shows the results.

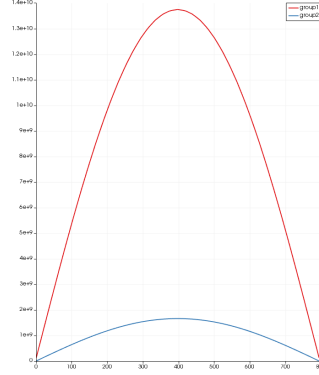


Figure 1: Group 1 and 2 fluxes at 10 msec.

## 1.2 1D-fuel-action

- Mesh: GeneratedMesh
- Transient problem.

Figure 2 shows the results.

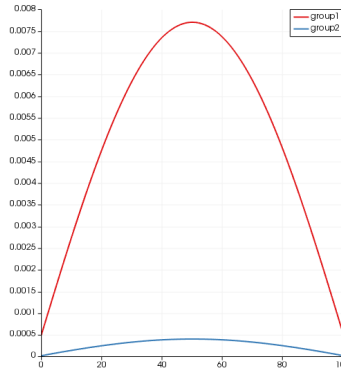


Figure 2: Group 1 and 2 fluxes at 10 msec.

## 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:  $k_{eff} = 1.415418$ .

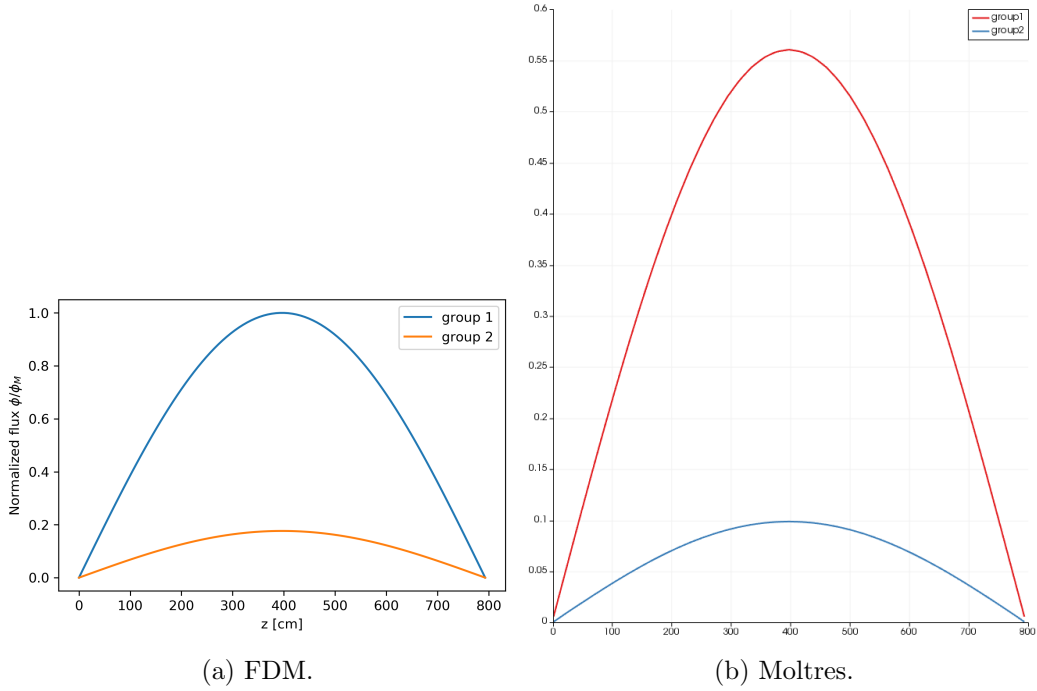


Figure 3: Steady state Group 1 and 2 fluxes.

#### 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  $k_{eff} = 1.420210$ . 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  $k_{eff} = 1.424644$ .

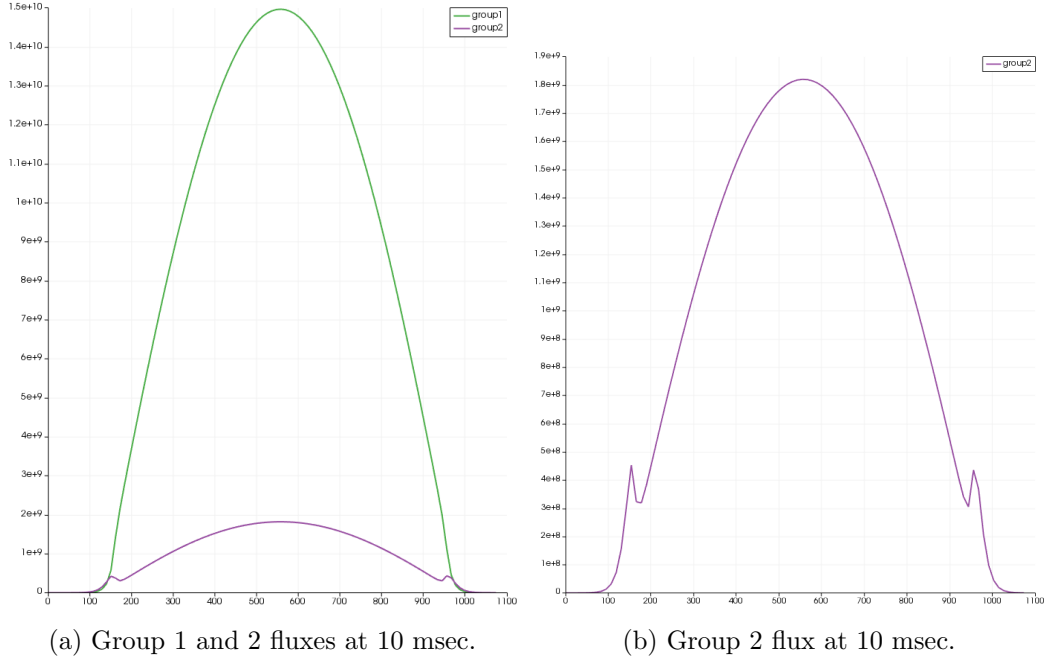


Figure 4: Transient problem fluxes.

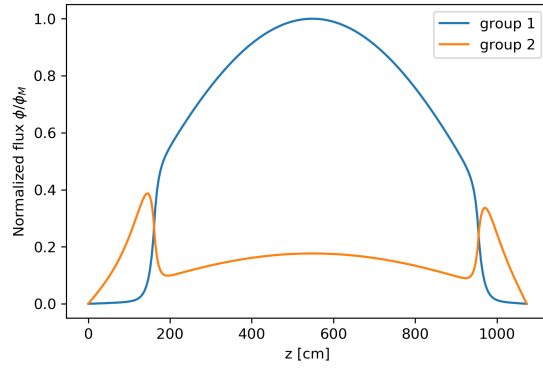


Figure 5: Steady state Group 1 and 2 fluxes using 1D FDM.

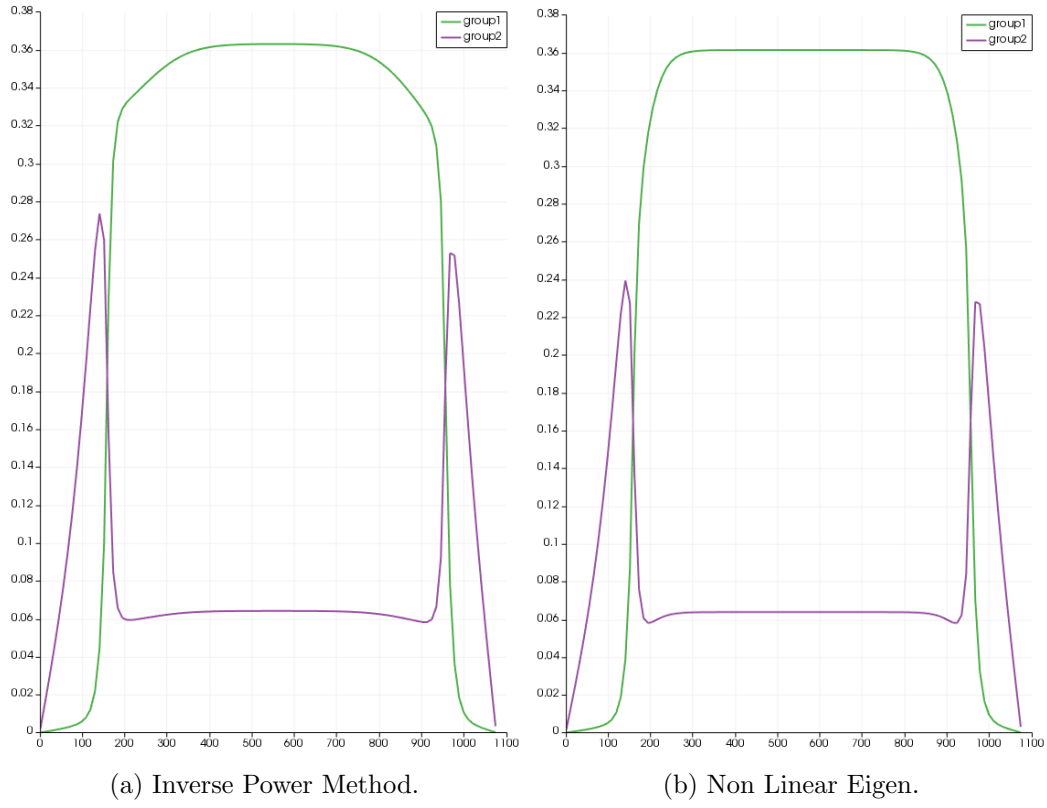


Figure 6: Steady state Group 1 and 2 fluxes for different eigenvalue iteration methods.