1 3D-neutronics

1.1 3D-unitcell

- Input file: *3D-unitcell.i*

- Mesh: *3D-unitcell.msh*

- Transient problem.

Figure 1 displays the geometry. Figure 2 shows the results.
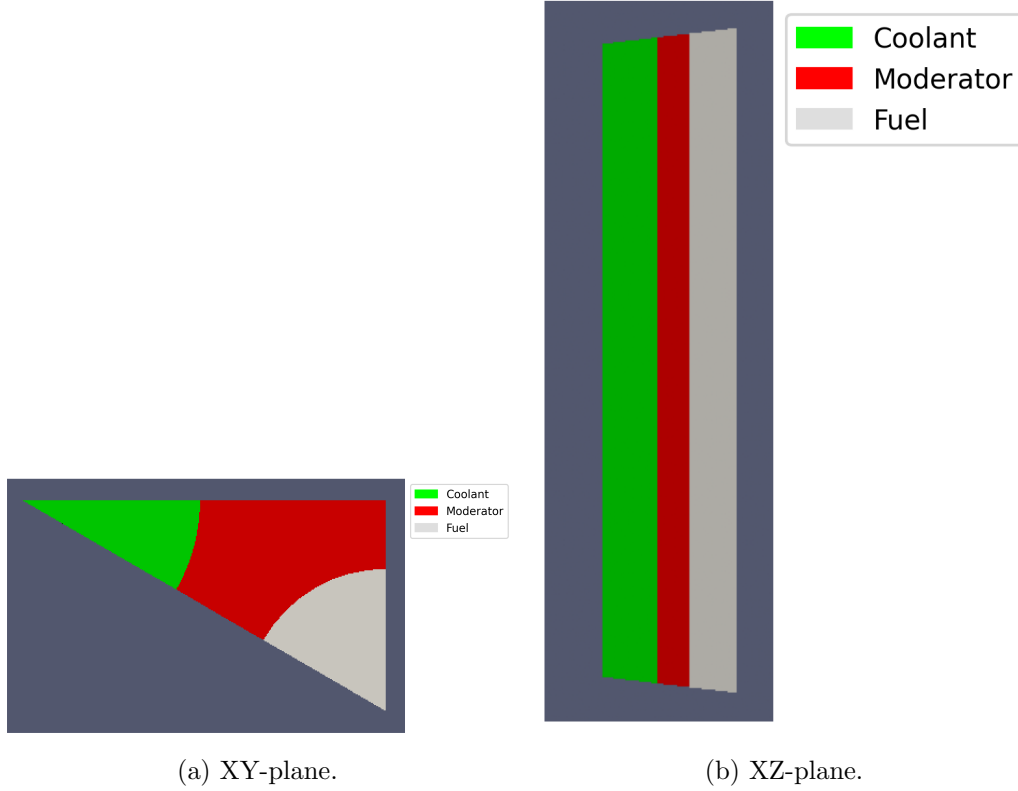

(a) XY-plane.   (b) XZ-plane.

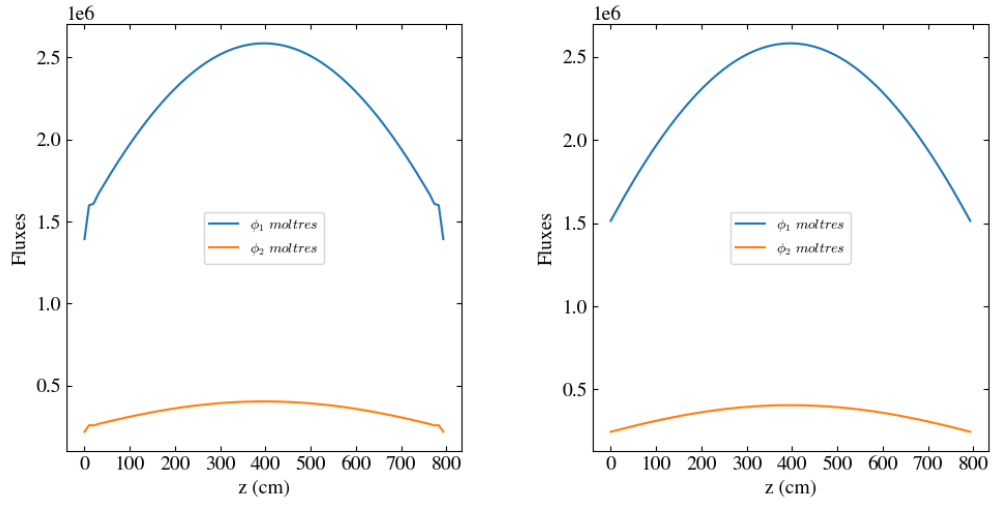Figure 1: *3D-unitcell* scaled down geometry.

1.2 3D-unitcell-reflec

- Input file: *3D-unitcell-reflec.i*

- Mesh: *3D-unitcell-reflec.msh*

- Transient problem.

Figure 3 displays the geometry. Figure 4 shows the results.
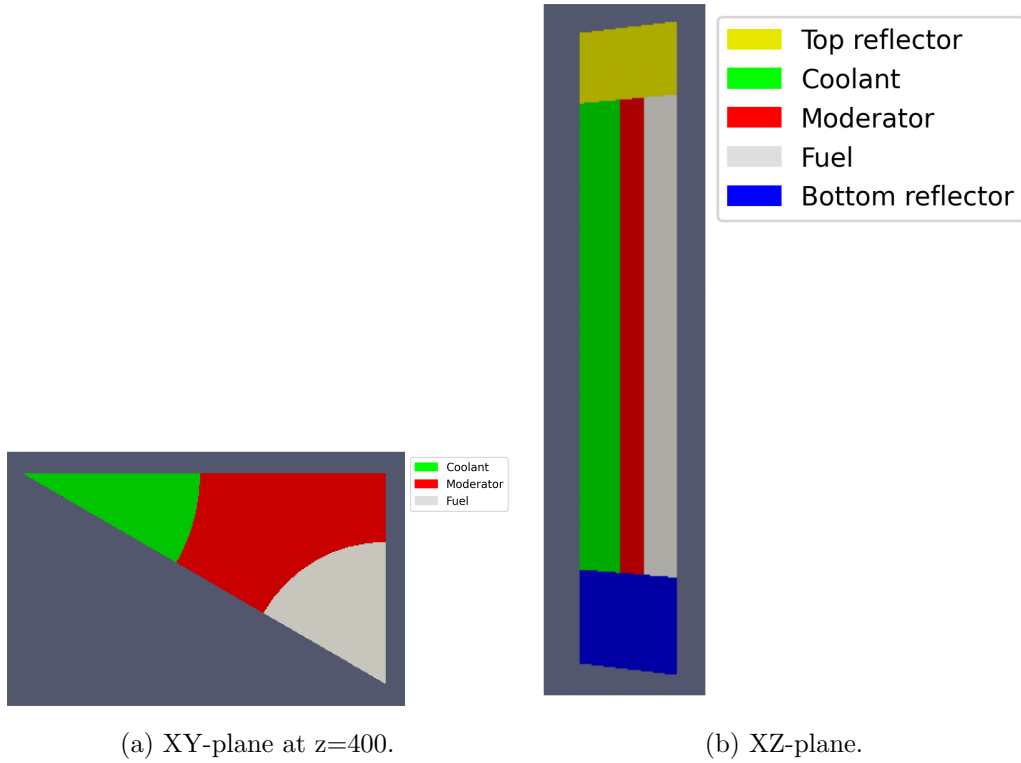
1.3 3D-unitcell-reflec-homo

- Input file: *3D-unitcell-reflec-homo.i*
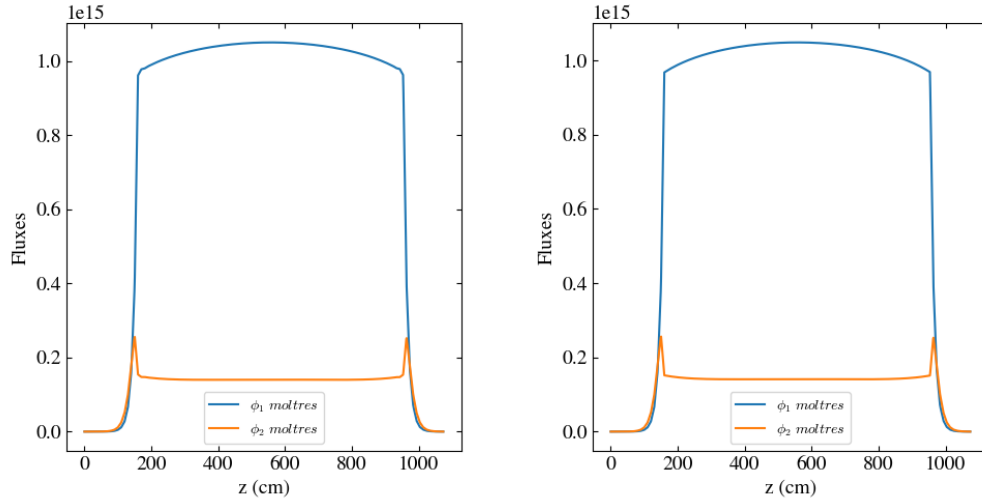
- Mesh: *3D-unitcell-reflec.msh*

(a) Fuel centerline between points (1.628,-0.939,0) and (1.628,-0.939,793).

(b) Coolant centerline between points (0,0,0) and (0,0,793).

Figure 2: Group 1 and 2 axial fluxes in different locations of the unitcell at 10 msec.

(a) XY-plane at z=400.

(b) XZ-plane.

Figure 3: *3D-unitcell-reflec* scaled down geometry.

(a) Fuel centerline between points (1.628,-0.939,0) and (1.628,-0.939,1073).

(b) Coolant centerline between points (1.628,-0.939,0) and (1.628,-0.939,1073).

Figure 4: Group 1 and 2 axial fluxes in different locations of the unitcell at 10 msec.

- Transient problem.

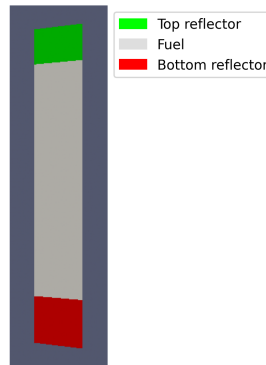Figure 5 displays the geometry. Figure 6 shows the results.

Figure 5: *3D-unitcell-reflec* scaled down geometry.

1.4   3D-assembly-action

- Input file: *3D-assembly-action.i*

- Mesh: *3D-assembly-30deg-reflec.msh*

- Transient problem.

Figure 7 displays the geometry. Figure 8 shows the results.

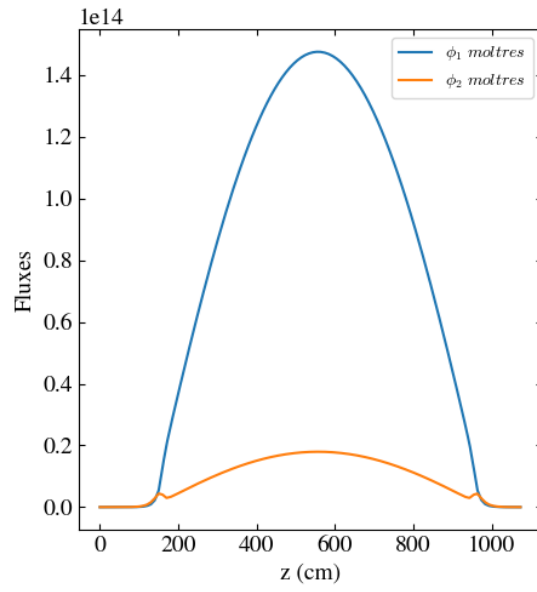## 1.5   3D-assembly-homo-action

- Input file: *3D-assembly-homo-action.i*
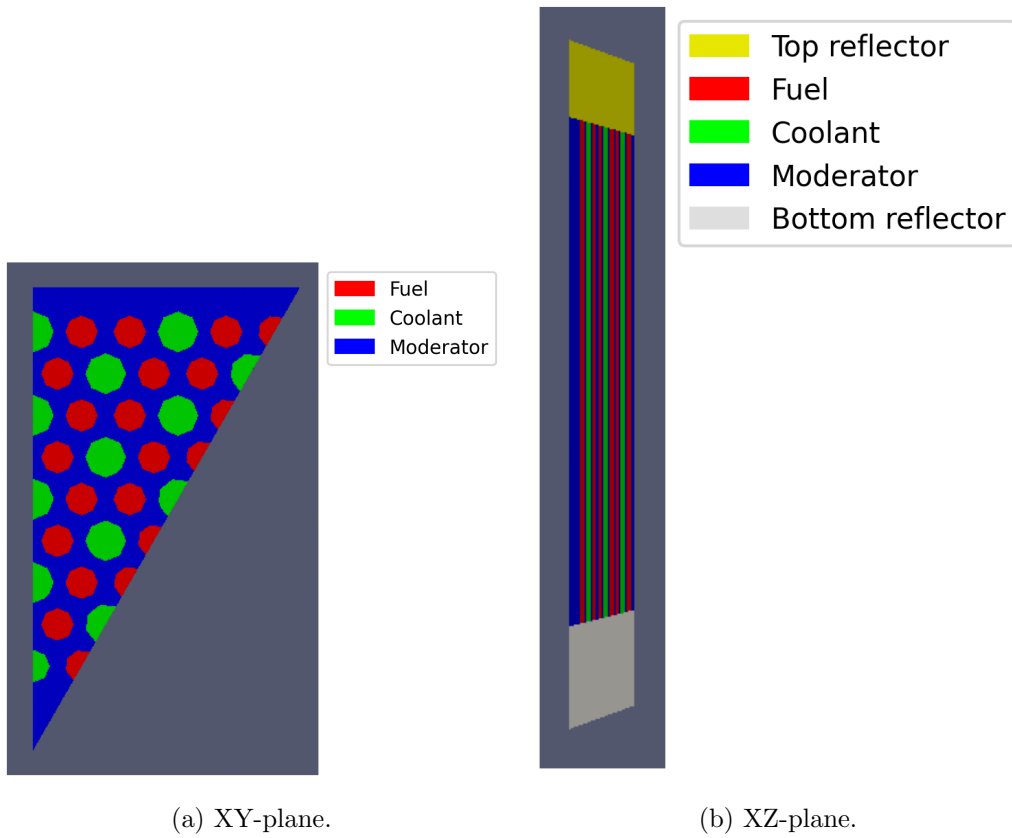
Figure 6: Group 1 and 2 fluxes at 10 msec.

(a) XY-plane.

(b) XZ-plane.

Figure 7: *3D-assembly-30deg-reflec* scaled down geometry.

(a) Fuel centerline between points (0.94,8.14,0) and (0.94,8.14,1073).

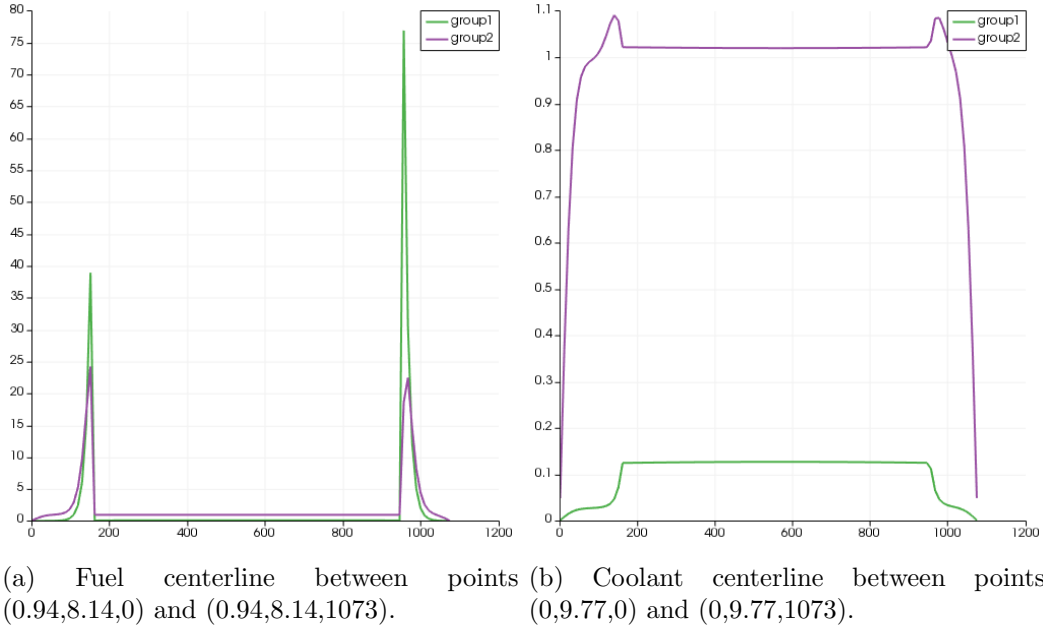(b) Coolant centerline between points (0,9.77,0) and (0,9.77,1073).

Figure 8: Group 1 and 2 axial fluxes in different locations of the fuel assembly at 1 msec.

- Mesh: *3D-assembly-30deg-reflec.msh*

- Transient problem.

- Fuel, Moderator, and coolant are homogenized.

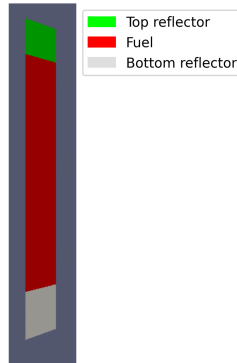Figure 9 displays the geometry. Figure 10 shows the results.

Figure 9: *3D-assembly-30deg-reflec* scaled down geometry.

1.6 3D-fullcore-120-homo

- Input file: *3D-fullcore-120-homo.i*

- Mesh: *3D-fullcore-120-homo.msh*

- Transient problem.

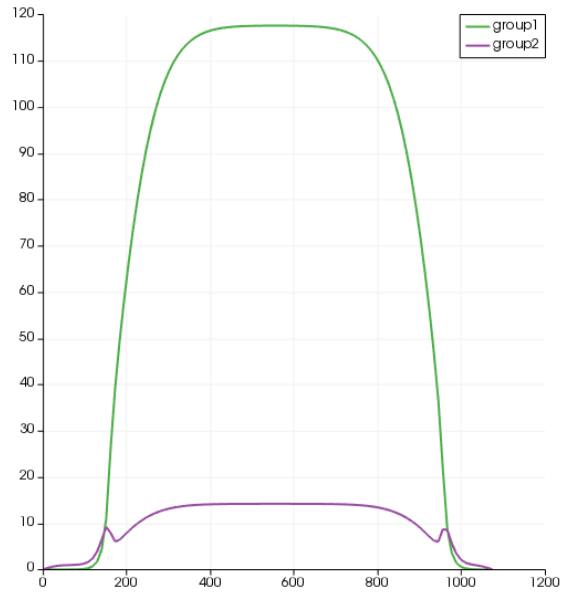Figure 11 displays the geometry. Figure 12 shows the results.

Figure 10: Group 1 and 2 axial flux at 1 msec.

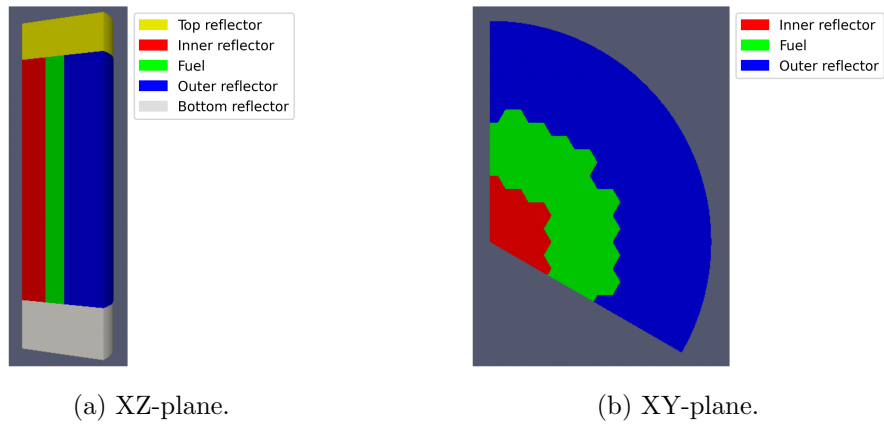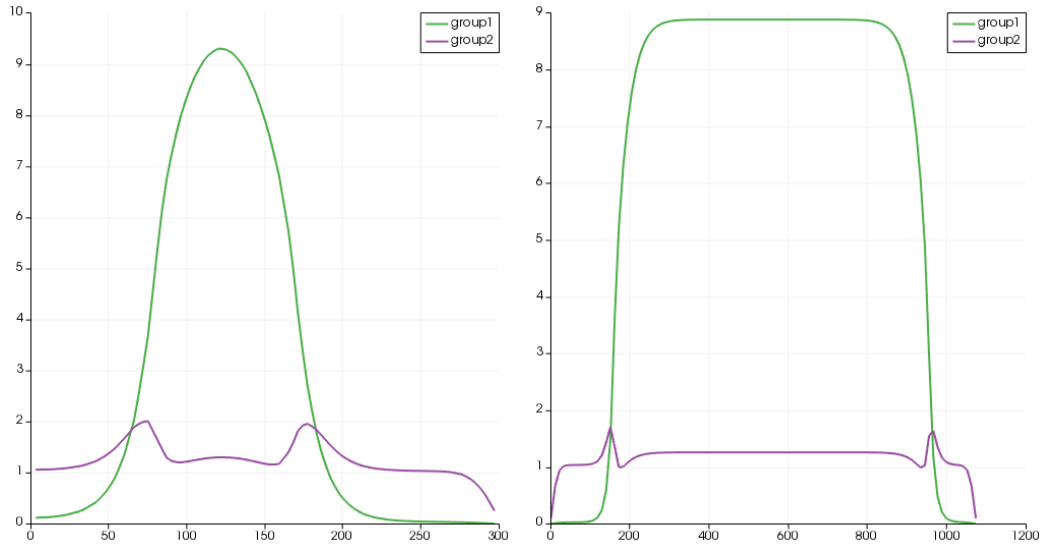(a) XZ-plane.

(b) XY-plane.

Figure 11: *3D-fullcore-120-homo* geometry.

(a) Radial flux between points (0,0,400) and (300,0,400).

(b) Axial flux between points (120,-60,0) and (120,-60,1073).

Figure 12: Group 1 and 2 axial fluxes in different locations at 1 msec.