SERPENT – CFX COUPLING

KALTRINA SHEHU, DANIEL BONETE-WIESE, CHRISTIAN REITER

Serpent UGM
September 01st 2022

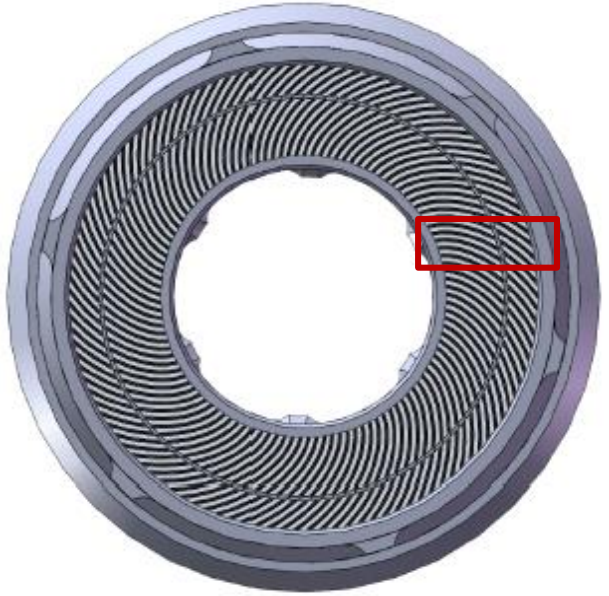
FORSCHUNGS-NEUTRONENQUELLE HEINZ MAIER-LEIBNITZ (FRM II)

20 MW power

Compact core with one fuel element

Conversion to lower enriched fuel.

Data of the current HEU core is used as a verification and valid



1D VS 3D

1D calculations → more conservative and based on empirical correlations

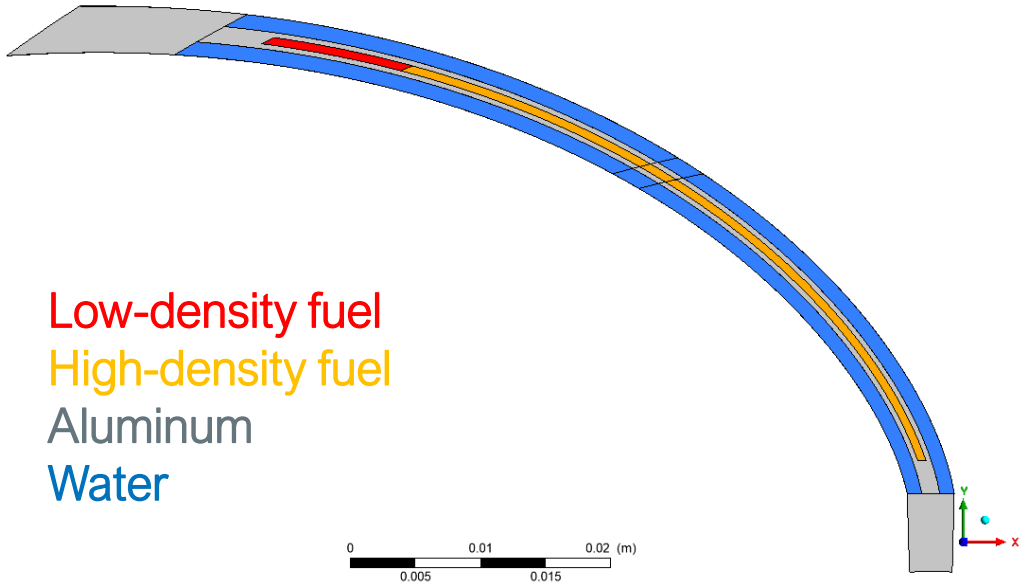
→ well-known procedure for licensing

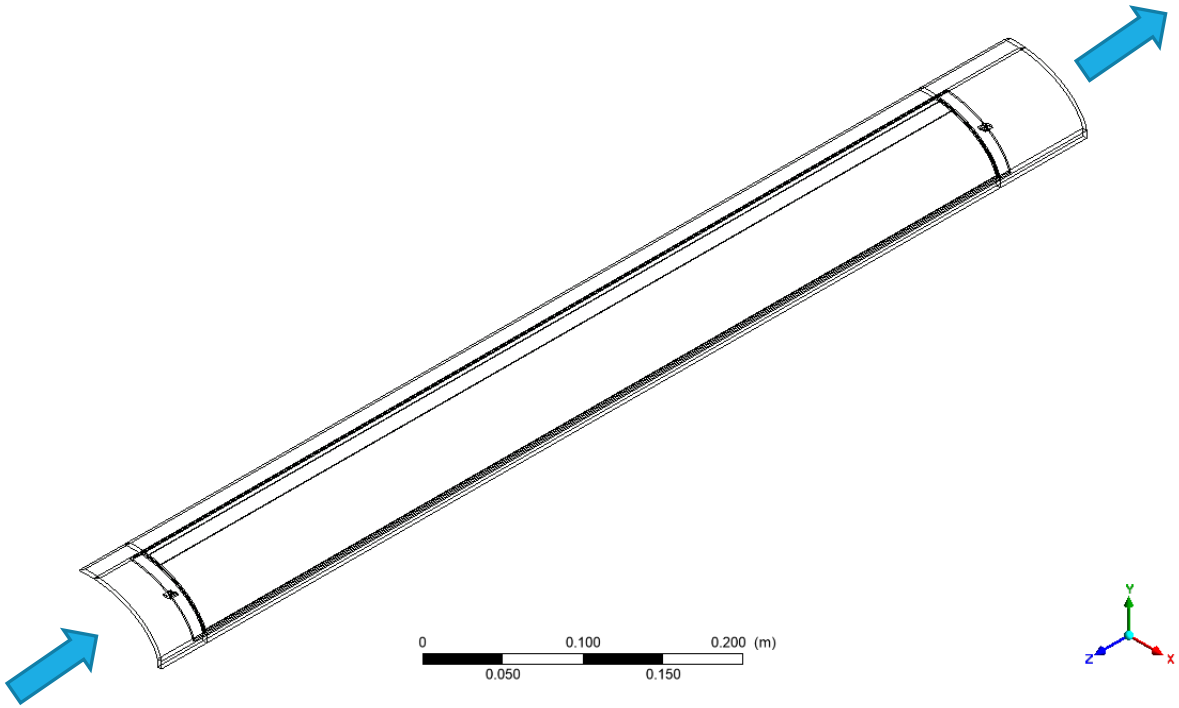
3D calculations → more accurate to reality

→ relatively “new”

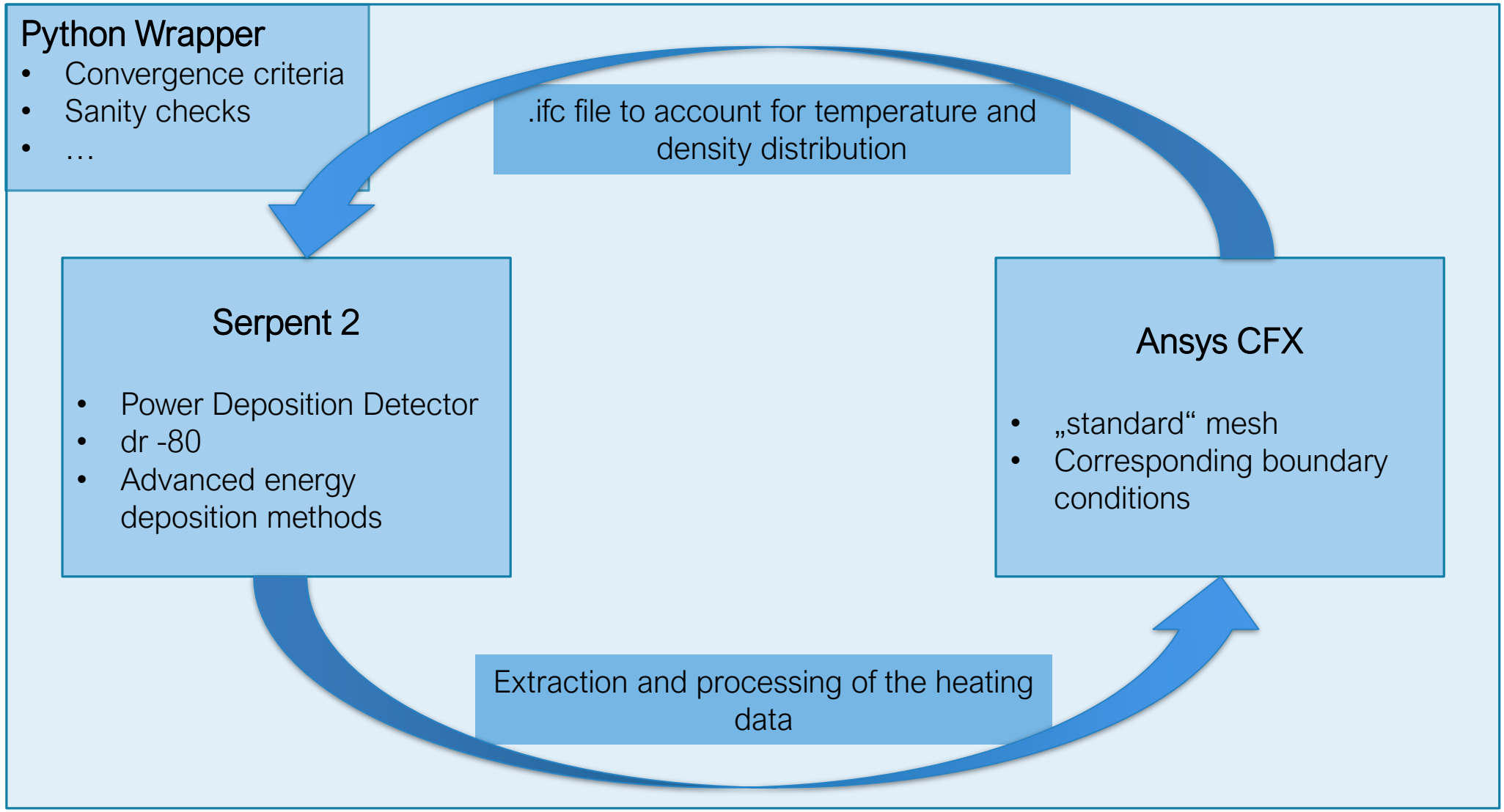
Need for verification and validation of 3D methods ⟷ Possibility to explore numerous reactor designs

FRM II CORE

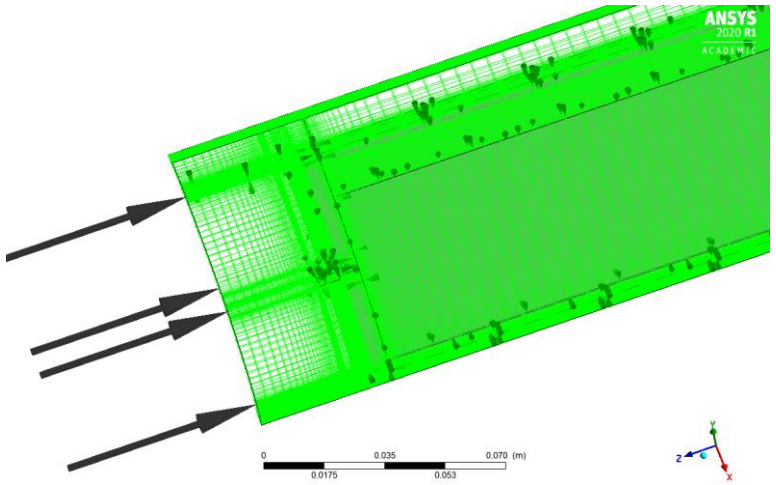

Low-density fuel
High-density fuel
Aluminum
Water
0
0.01
0.02 (m)
0.005
0.015
Y
X

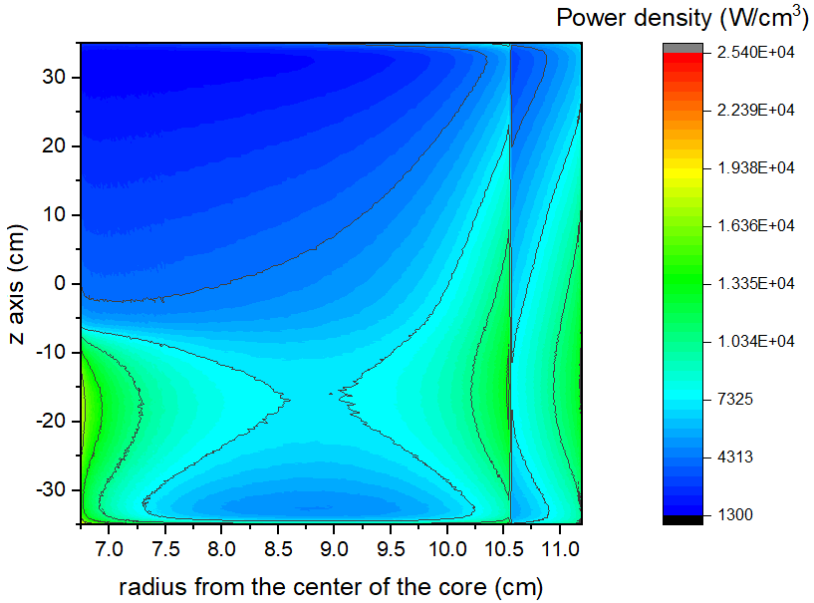

0
0.100
0.200 (m)
0.050
0.150
Y
Z
X

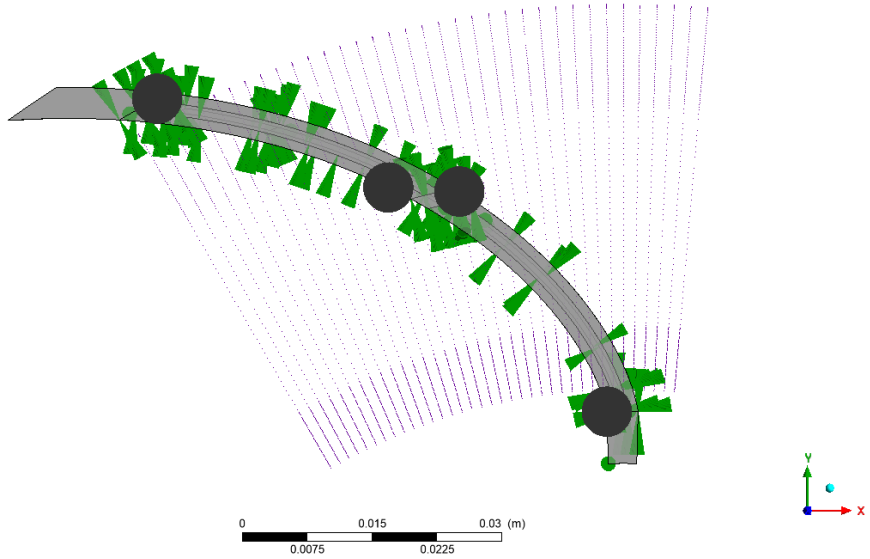
SERPENT 2 – ANSYS CFX COUPLING



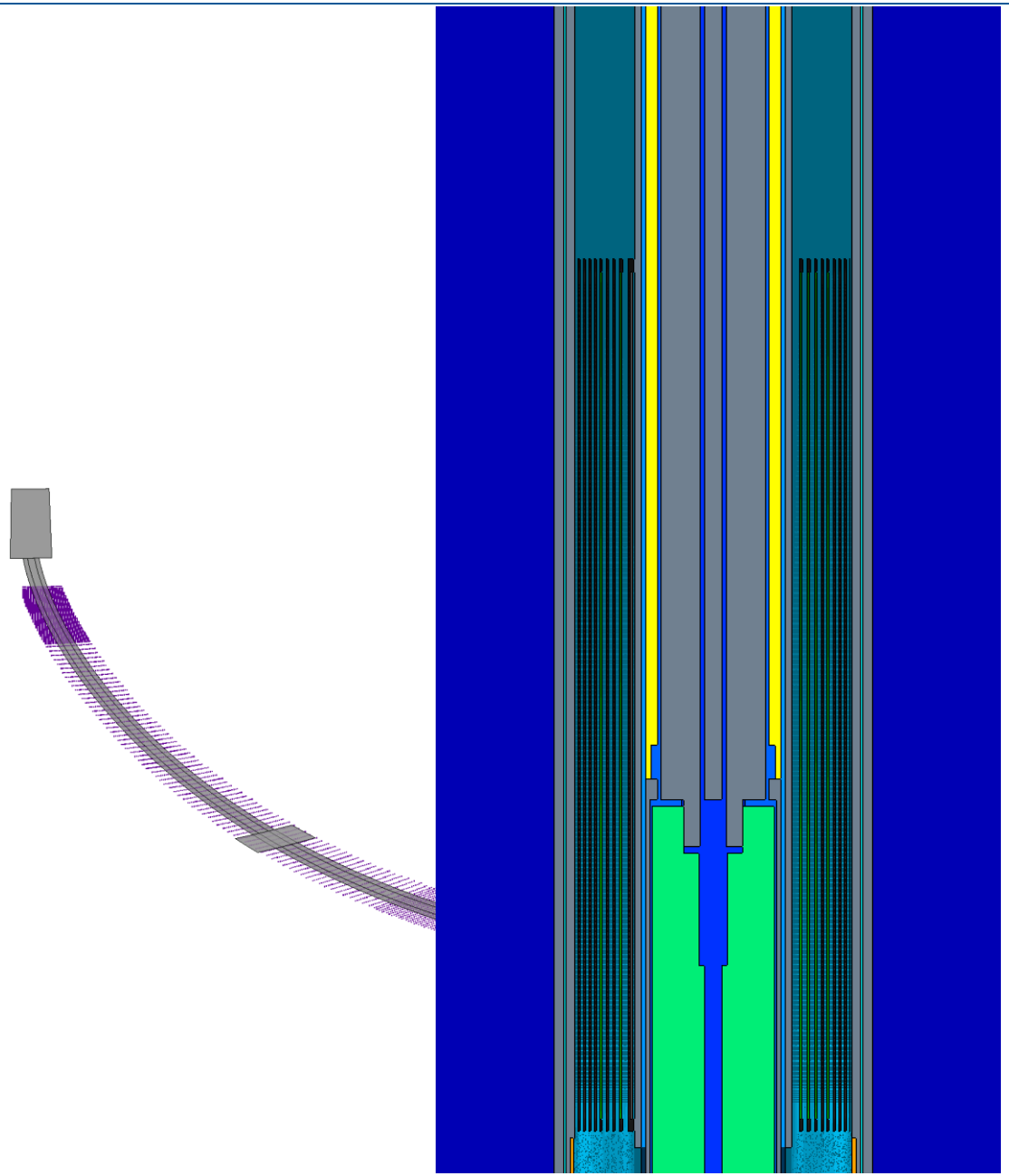
SERPENT 2 – ANSYS CFX COUPLING

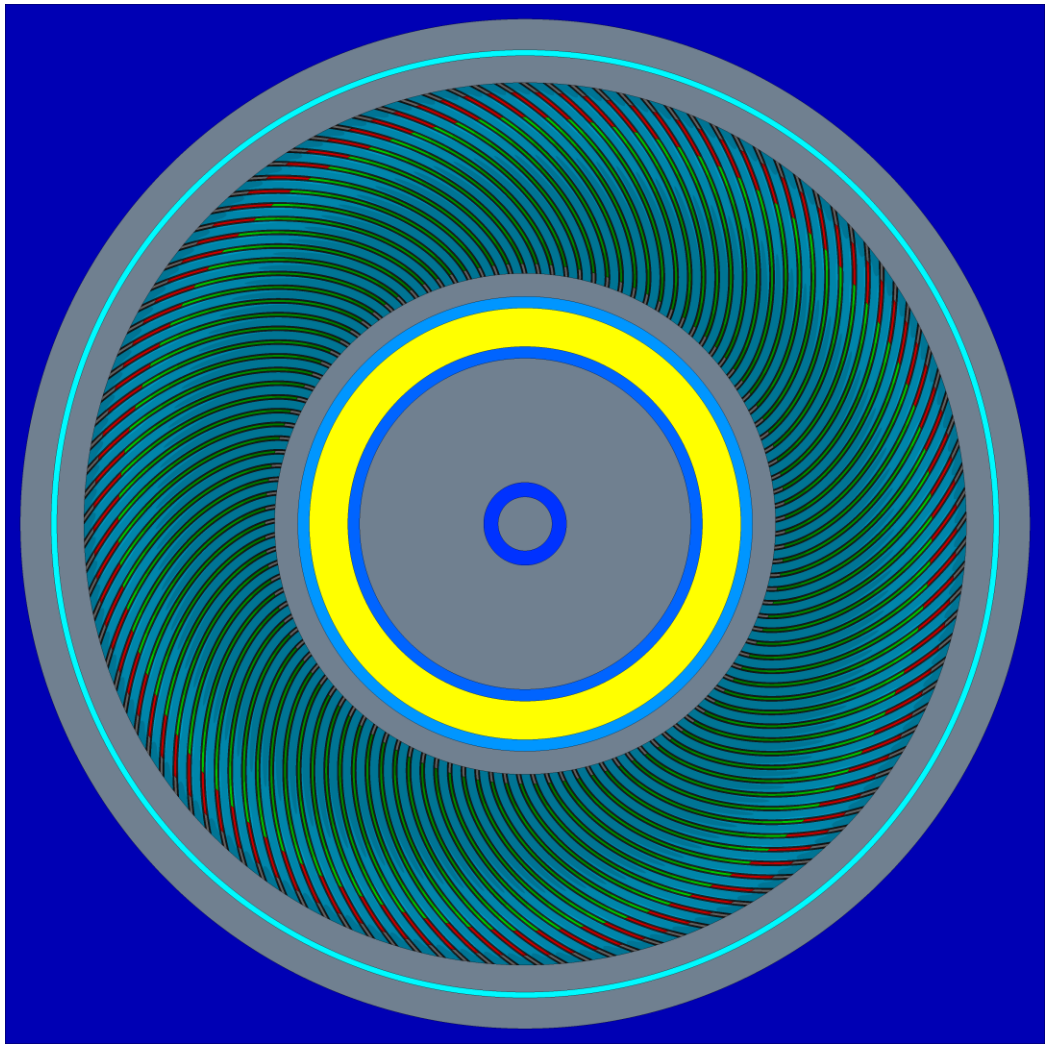






Initialized with a .csv file and assigned to the fuel domain





THANK YOU