PWR Single Pin %title

**c cellnumber | mat(0 is void) | density in g/cm3(-) atomedensity(+) | cell 1 is inside 1 AND inside 10 AND outside 20 | imp 0 neutron is killed**

**c cell 1 is fuel palette**

1 1 -10.41 -1 -10 20 imp:n=1

**c cell 2 is void between fuel and cladding**

2 0 1 -2 -10 20 imp:n=1

**c cell 3 is Zr tube**

3 3 -6.55 2 -3 -10 20 imp:n=1

**c cell 4 is water**

4 4 -0.7 3 -5 6 -7 8 -10 20 imp:n=1

**c cell 5 is void outside**

5 0 5:-6:7:-8:10:-20 imp:n=0

**c surface number | cz: cylinder centered at z axis | radius in cm |$ is comment**

c Rods dimensions

**c fuel diameter**

1 cz 0.41 $

**c cladding inner diameter**

2 cz 0.42 $

**c cladding outer diameter**

3 cz 0.48 $

**c \*means the surface is a reflector | px: yz plane, py:xz plane | located at x=0.63 cm**

**c Basic lattice cell**

\*5 px 0.63

\*6 px -0.63

\*7 py 0.63

\*8 py -0.63

**c z axis limits**

\*10 pz 200.0

\*20 pz -200.0

**c m1 material number 1 | 8 is z(Oxygen) 016 is O16 | .13c library number | composition 2.0 +means atomic ratio,**

c Material 1

**c m1 is fuel UO2 (5% U235 and 95% U238)**

m1 8016.13c 2.0

92235.63c 0.05

92238.63c 0.95

c Material 4

**c m4 is H2O (1H, 16O)**

m4 1001.78c 2

8016.78c 1

mt4 lwtr.04t

c Material 3

**c m3 is Zr 000 means natural isotope**

m3 40000.12c 1.

C Material 1 Components

**c m11 is U235**

m11 92235.63c 1.

**c m12 is U238**

m12 92238.63c 1.

**c m13 is Pu239**

m13 94239.63c 1.

**c m14 is Sm152**

m14 62152.63c 1.

**c: f4: ave volumetric flux over the cell normalized to the volume of the cell |**

c -------- Tallies --------

fc4 Tally 4

f4:n 1 3 4

e4:n 1e-6 1. 20. **c** **energy boundaries of each energy bin**

fc14 Tally 14

f14:n 1

**c: fm14: multiplier tally: reaction rate | 2 abs 6 fission**

fm14 (1 1 (-2) (-6)) **c abs and fission rate in mat 1 : fuel**

(1 11 (-2) (-6)) **c abs and fission rate in mat 11 : U235**

(1 12 (-2) (-6)) **c abs and fission rate in mat 12 : U238**

(1 13 (-2) (-6)) **c abs and fission rate in mat 13 : Pu239**

(1 14 (-2) ) **c abs rate in mat 14 : Sm152**

fc24 Tally 24

f24:n 3

fm24 1 3 (-2) **c abs rate in mat3 : Zr cladding**

fc34 Tally 34

f34:n 4

fm34 1 4 (-2) **c abs rate in mat4 : water**

c --------------------------

**c generate 1000 neutrons per cycle | k initial =1 |run the code for 250 cycles and drop the first 50**

kcode 1000 1.00 50 250

**c neutron source (seed)initial at 0 0 0**

ksrc 0. 0. 0.

**c print all**

print

mode n