MOOSE Project Part 2

- Fuel pin dimensions listed – 2D RZ
- Assume reasonable values for thermal conductivities, constant
- Utilize axial T_{cool}, with T_{cool}^{in}= 500 K, reasonable flow rate, heat capacity, etc.
- Utilize axial LHR, with LHR^0=350 W/cm

$$LHR\left(\frac{z}{Z_o}\right) = LHR^o \cos\left[\frac{\pi}{2\gamma}\left(\frac{z}{Z_o} - 1\right)\right] = LHR^o\, F\left(\frac{z}{Z_o}\right)$$

$$T_{cool} - T_{cool}^{in} = \frac{1}{1.2}\frac{Z_o \times LHR^o}{\dot{m} C_{PW}}\left\{\sin(1.2) + \sin\left[1.2\left(\frac{z}{Z_o} - 1\right)\right]\right\}$$

- Solve temperature profile for:
  - @ z=0.25, z=0.5, z=1
- Solve for centerline temperature vs time
  - Transient: LHR^0 = 500*[(t/100)^0.5]*[(1-(t/100))^4] + 150
  - @ z=0.25, z=0.5, z=1
- Find location of peak centerline temperature at steady-state and at t=100 in transient