MOOSE Part 1 Grading Notes

CeCe

Report was submitted. But was empty… I didn’t realize this until I was already grading (did yours last by chance), or I would have gotten you to turn in the completed report. Files all work. It all looks like it was right. I will give you the benefit of the doubt (mostly).

Grade: 80

Anthony

Defined material properties, all reasonable. Cited where needed. I like the work through of the fundamental equations. In equation 4, you have a square on the divergence, which doesn’t make sense. I like your method of setting up the mesh convergence. Maybe could have done nx and ny separately. In section 3.1, you mentioned a different way of doing mesh construction. I agree that this is usually preferable, but not required. Looked at stichedmeshgenerator. I would’ve liked you to have reported your values. What is the analytical temperature and what is the moose-based T? A single table would have provided this info. I see what you were doing with the volume-averaged kth, but its not that simple, since you have a temperature profile. Maybe if you discretized spatial regions and assigned temperatures, it would be closer to what is really happening. But I think just your curve in Fig 2 c is misleading. For transient, I would have liked to have gotten the actual data. What is the peak T, what time does it occur, etc. This is helpful for understanding/interpreting your results. I think I asked for peak T in the assignment. Overall, pretty good. You successfully did everything asked. Could see some slight changes in the report.

Grade: 95

Cole:

Good restatement of the problem. One error, 550 K is Tco, not 550 C. Looks like you worked through that correctly, but this was a typo. Analytical part all looks good. Did you perform a mesh convergence study? How did you settle on your prescribed mesh? I think it is probably too fine. I would argue that the most ‘sensible’ initial condition is what the prescribed temperature is. I defined the Tco as 550K, and thus I would set the initial temperature of the system at 550K. Wont make a difference in steady state, but will impact time of peak for transient. I would have liked to have seen plots of the temperature over r, showing the profile. This for constant k and k(T), then a T vs time plot for the transient. That is the best way to show the data. Also would have been good to plot the steady-state with const k data with the analytical, to provide validation evidence. Peak centerline temp for k(T) case is definitely wrong. I think you didn’t correct your units for the fuel kth. I think the equation you used is in W/m-K, not W/cm-K. Did you do mesh convergence for the transient? Just doing a more coarse mesh isn’t sufficient. By tweaking some of the tolerances in your solver, you can get it to converge. I set nl\_rel\_tol = 1e-10, nl\_abs\_tol = 1e-10, l\_tol = 1e-5, and it solved. Wanted to see more results presented. Lacking mesh convergence. Should have tweaked some of the executioner parameters. Pretty good.

Grade: 90

Gwen:

Grade: