NUCL 40200 Engineering of Nuclear Power Systems

Assignment 7

Problem: *Maximum temperature in a fuel plate under various coolant temperature conditions.*

For the metallic fuel plate of Figure 8.12, eliminate the gap and take the cladding bnded t the fuel, the fuel half-thickness is 0.52mm, the cladding thickness δ_c is 0.52, the fuel and cladding have constant conductivities k_f = 185 W/mK and k_c = 39 W/mK, and the volumetric energy generation rate is constant at 1330 MW/m^3.

Find the maximum fuel temperature and its location if

1. The boundary-cladding temperatures T_{co} are both equal to 360 K.
2. The left boundary cladding temperature $T_{co/B}$ is 360K while right boundary cladding temperature $T_{co/A}$ is 367K

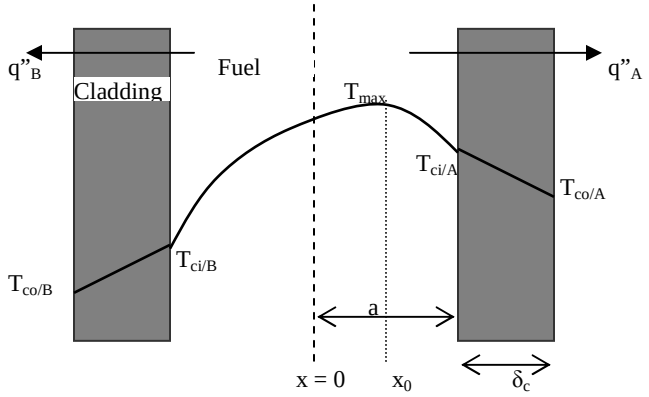

Figure 8.12 Plate with asymmetric temperature distribution