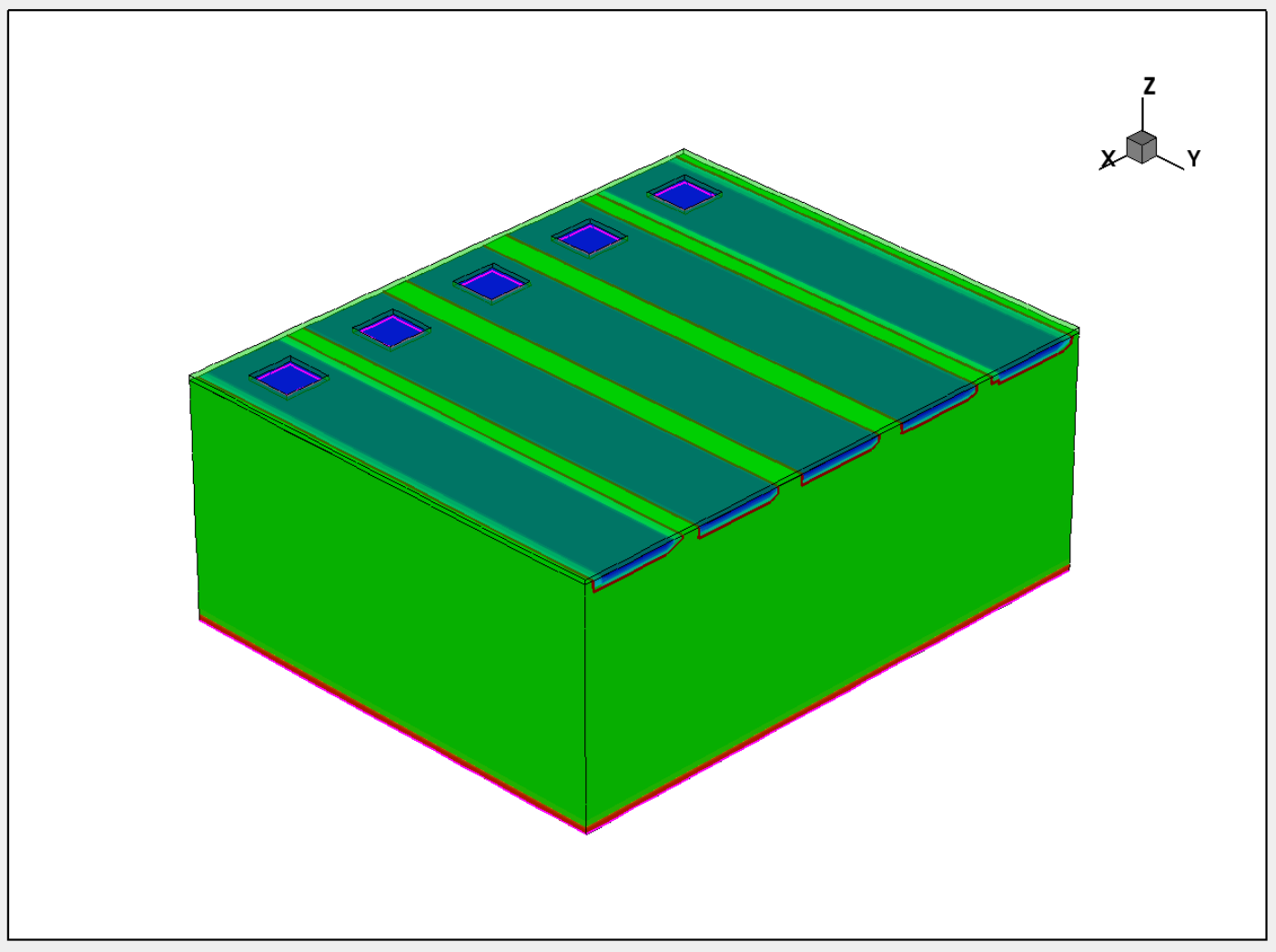
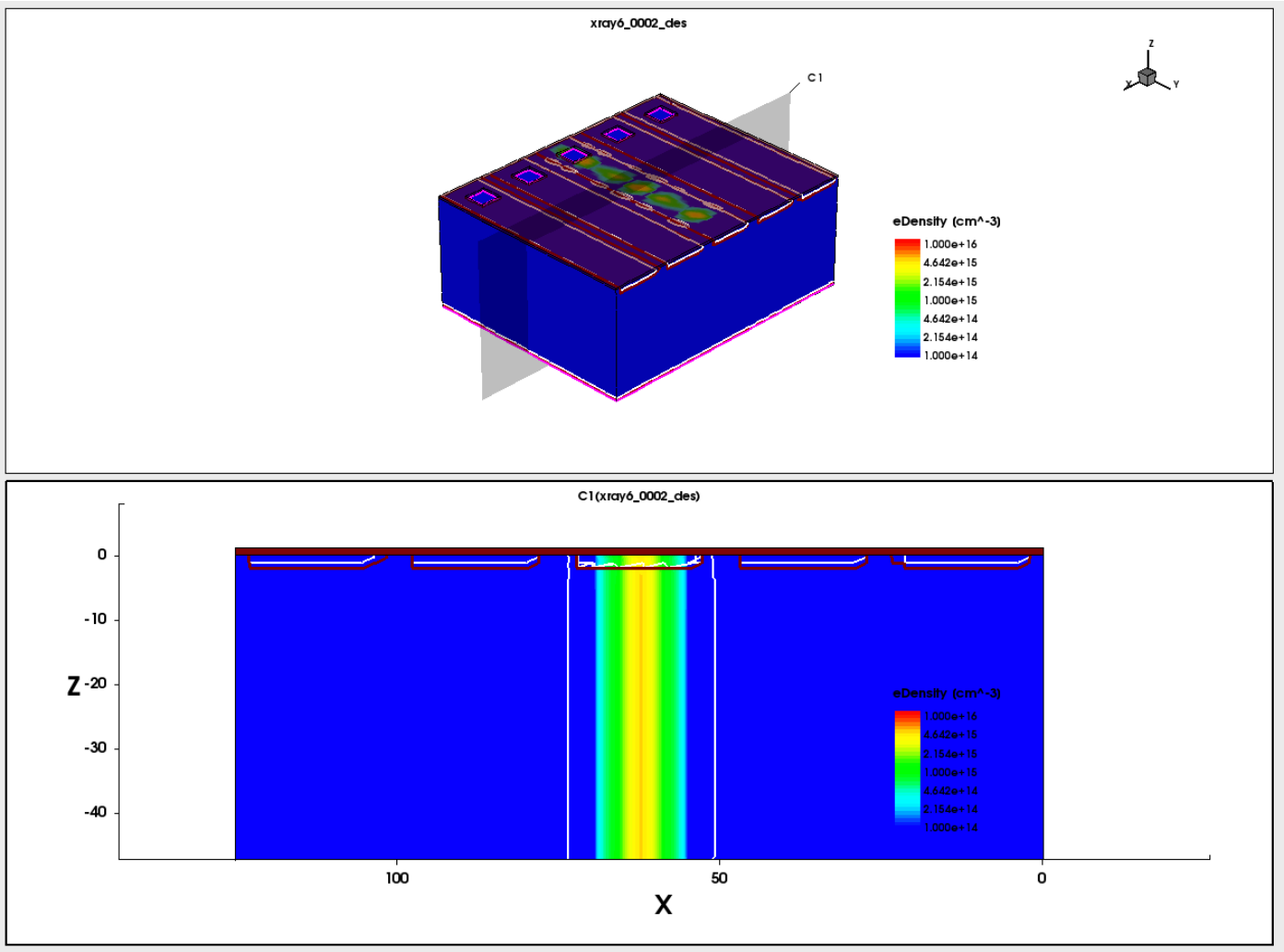
Strip detector with active edge: charge collection simulations

J. Segal, September 5 2013

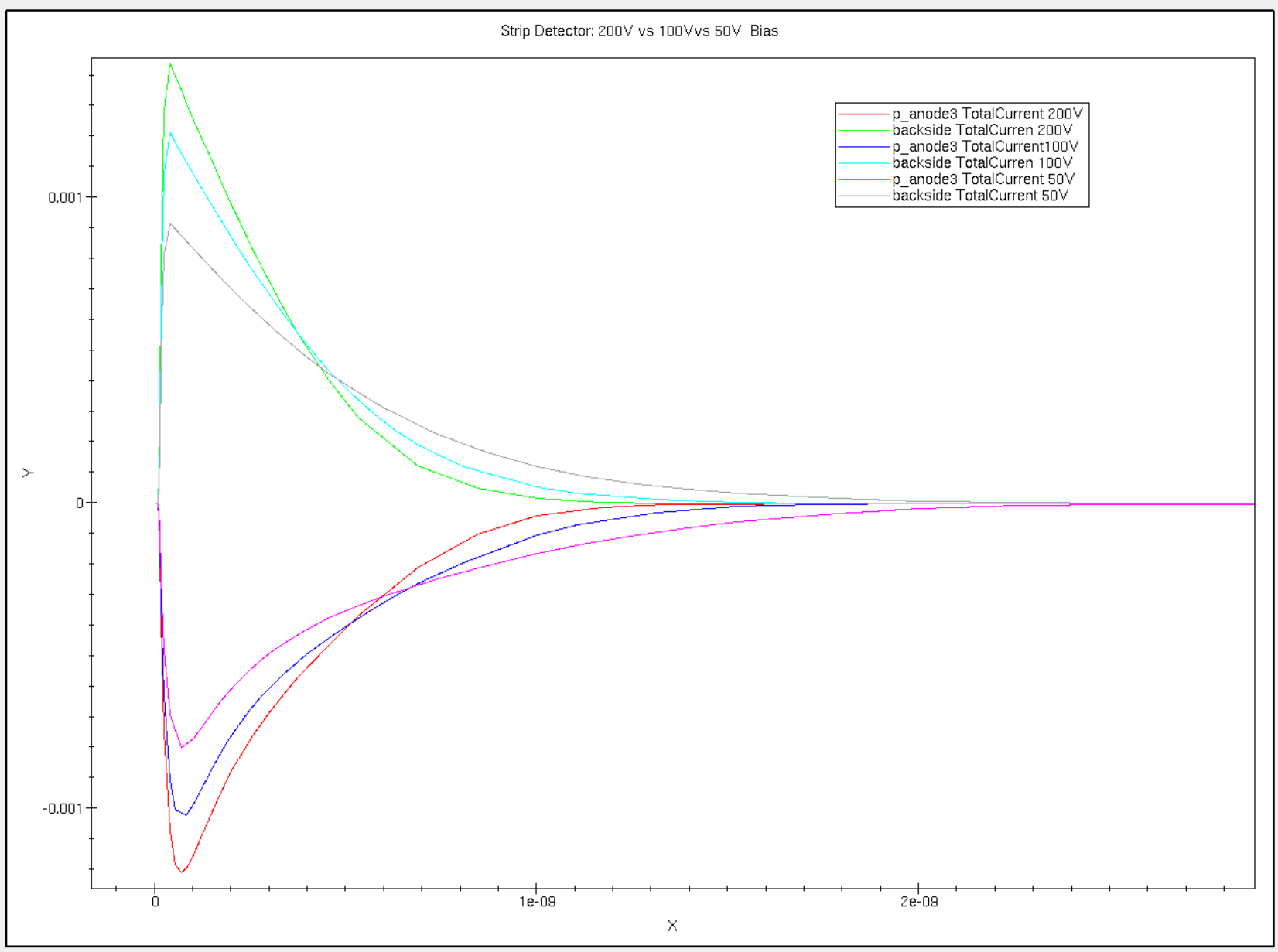
Structure: n-type substrate, n-type backside, p-type strips
Dimensions: 50um or 75um deep, 25um strip pitch, 100um strip length
Other physical parameters: 100ohms contact resistance, surface charge 5e10/cm2



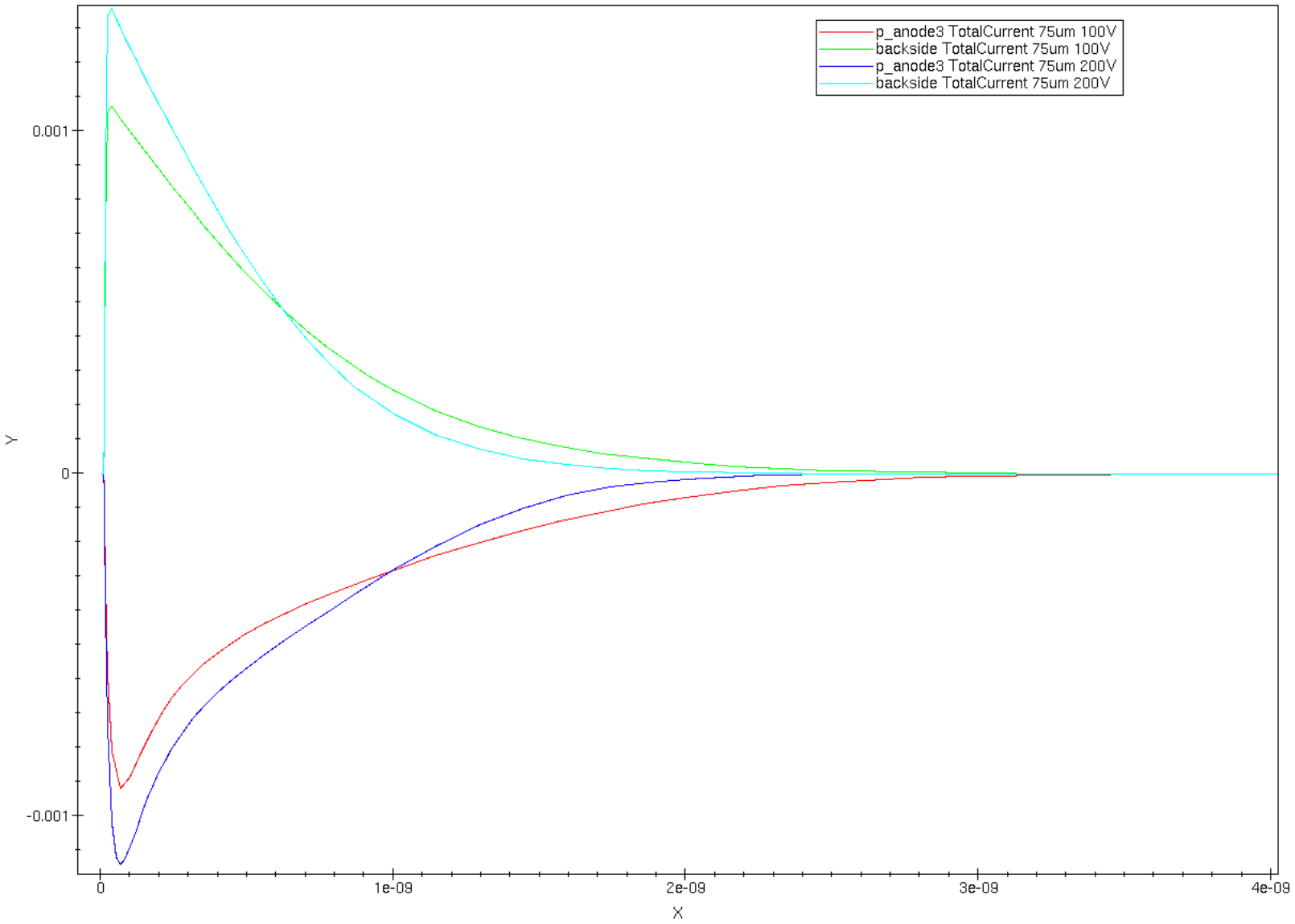
Charge Deposition in Simulation:
Total 1000 10KeV photon equivalent @50um



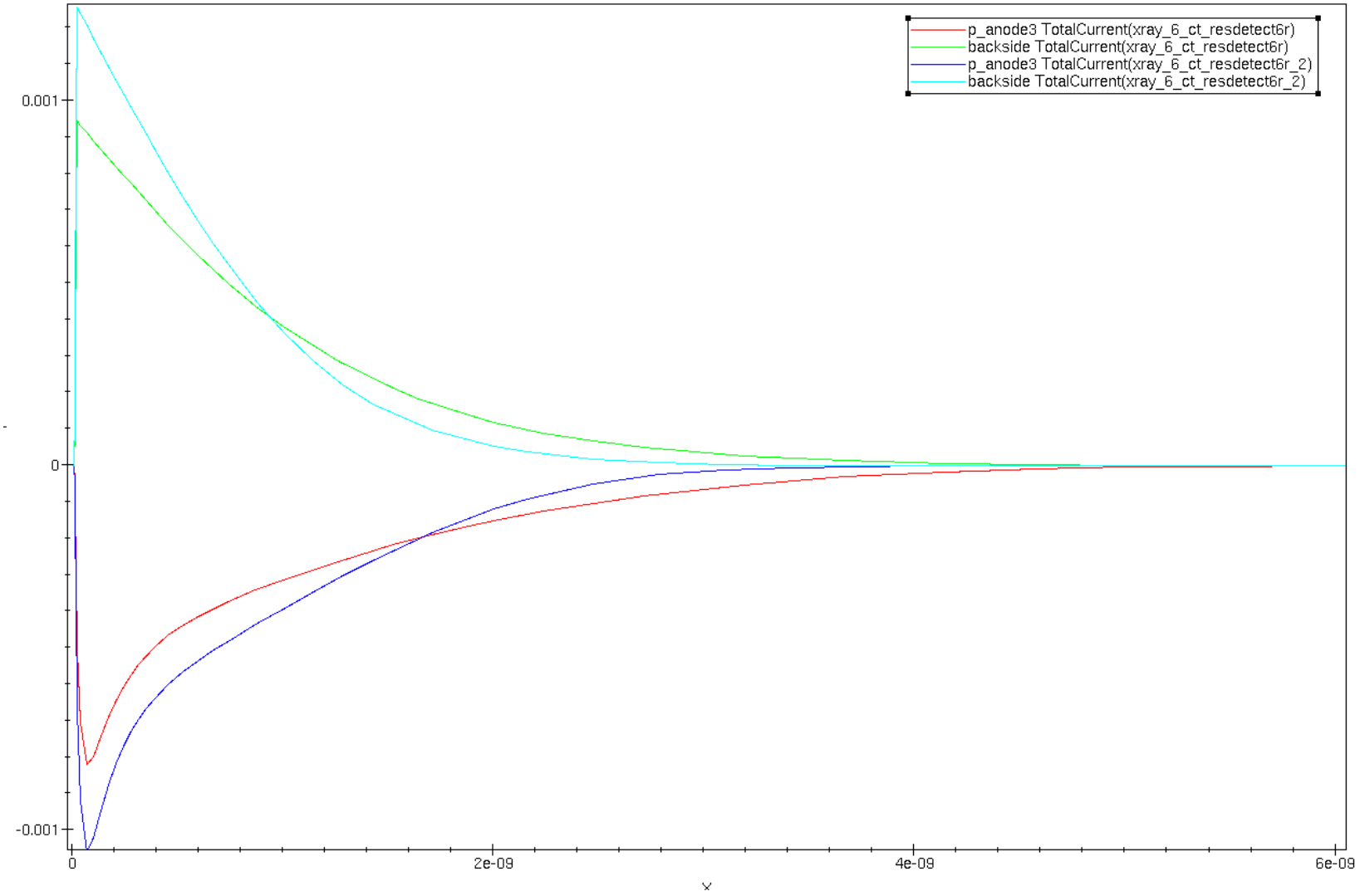
Contact Current vs. Time for 50um Thick Strip Detector 1000 10KeV Photon equivalent



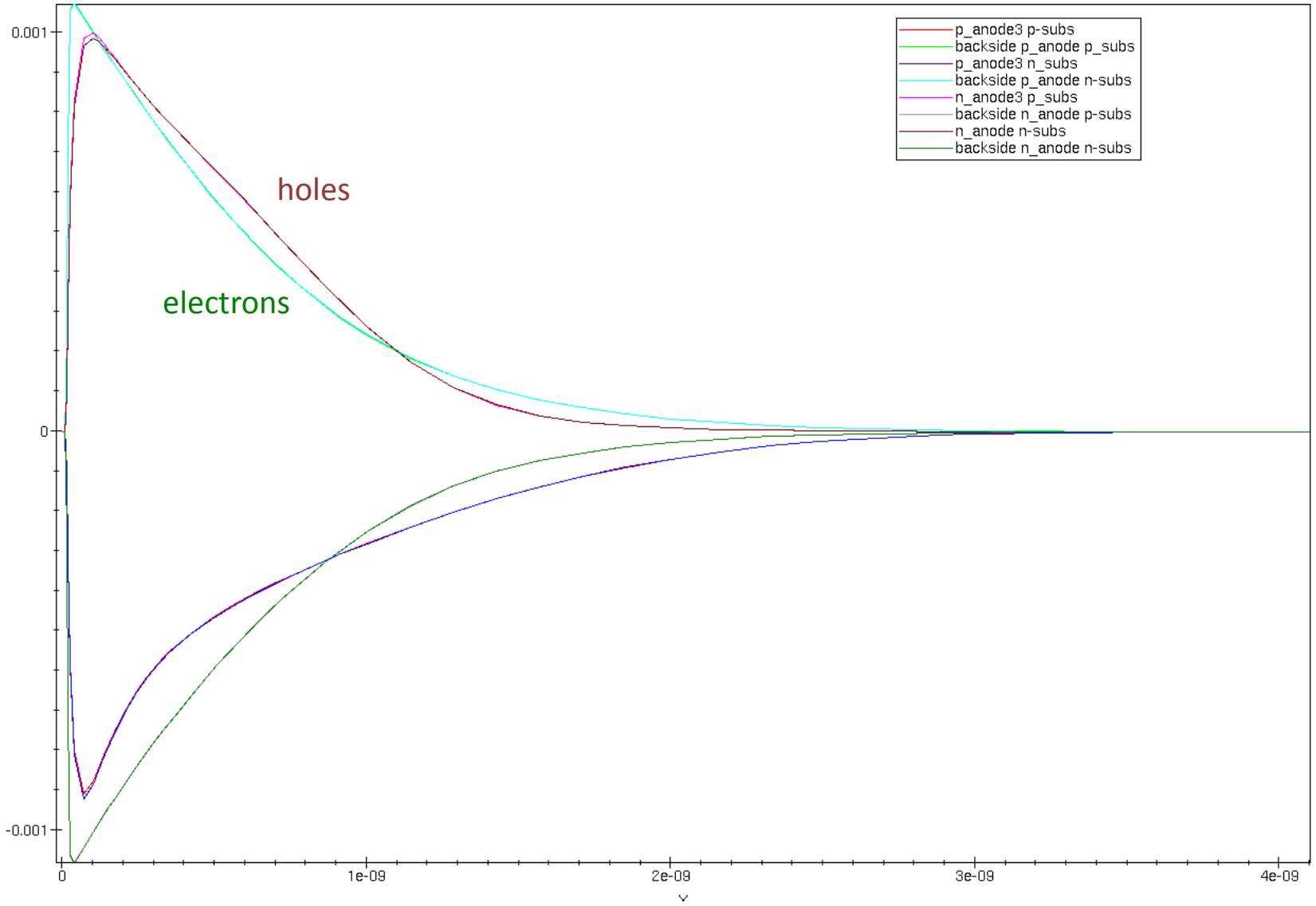
Contact Current vs. Time for 75um Thick Detector 1500 10KeV Photon Equivalent



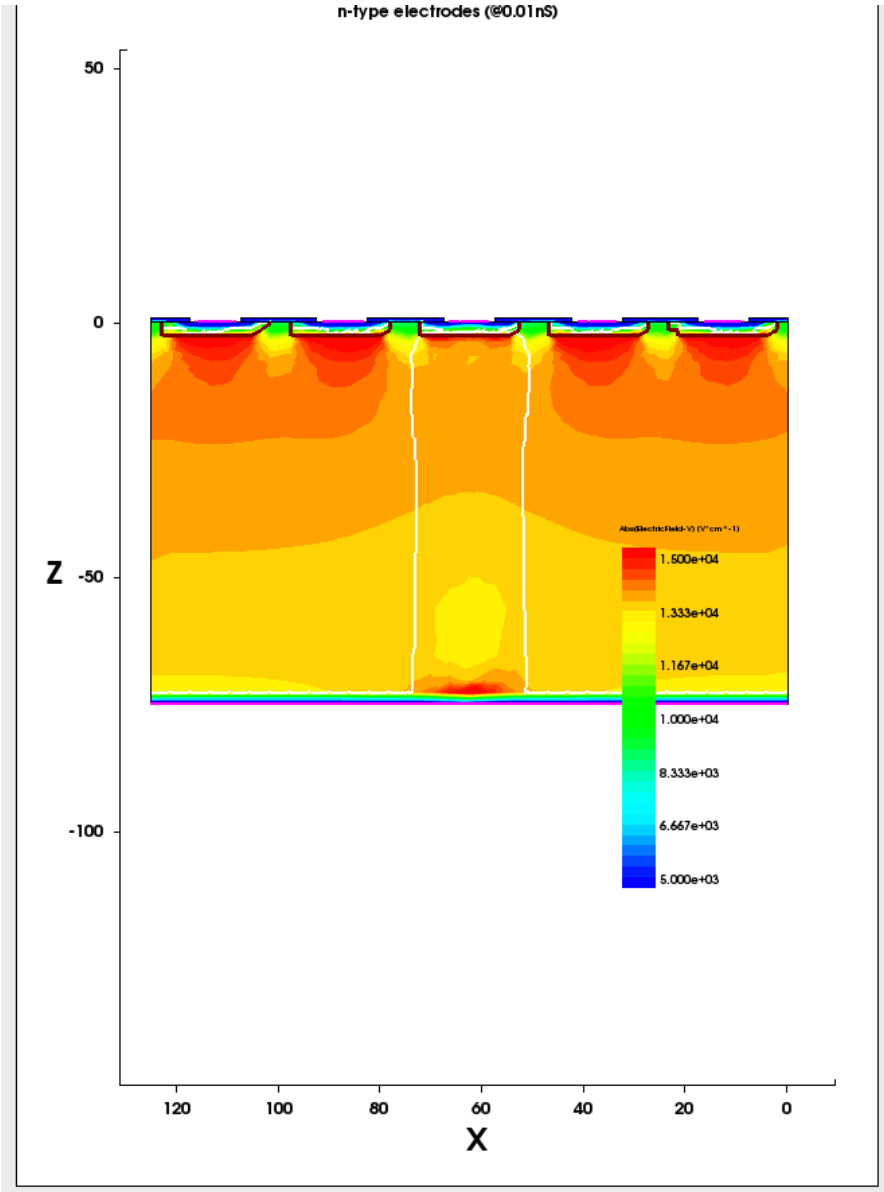
Contact Current vs. Time for 100um Thick Detector 2000 10KeV Photon Equivalent

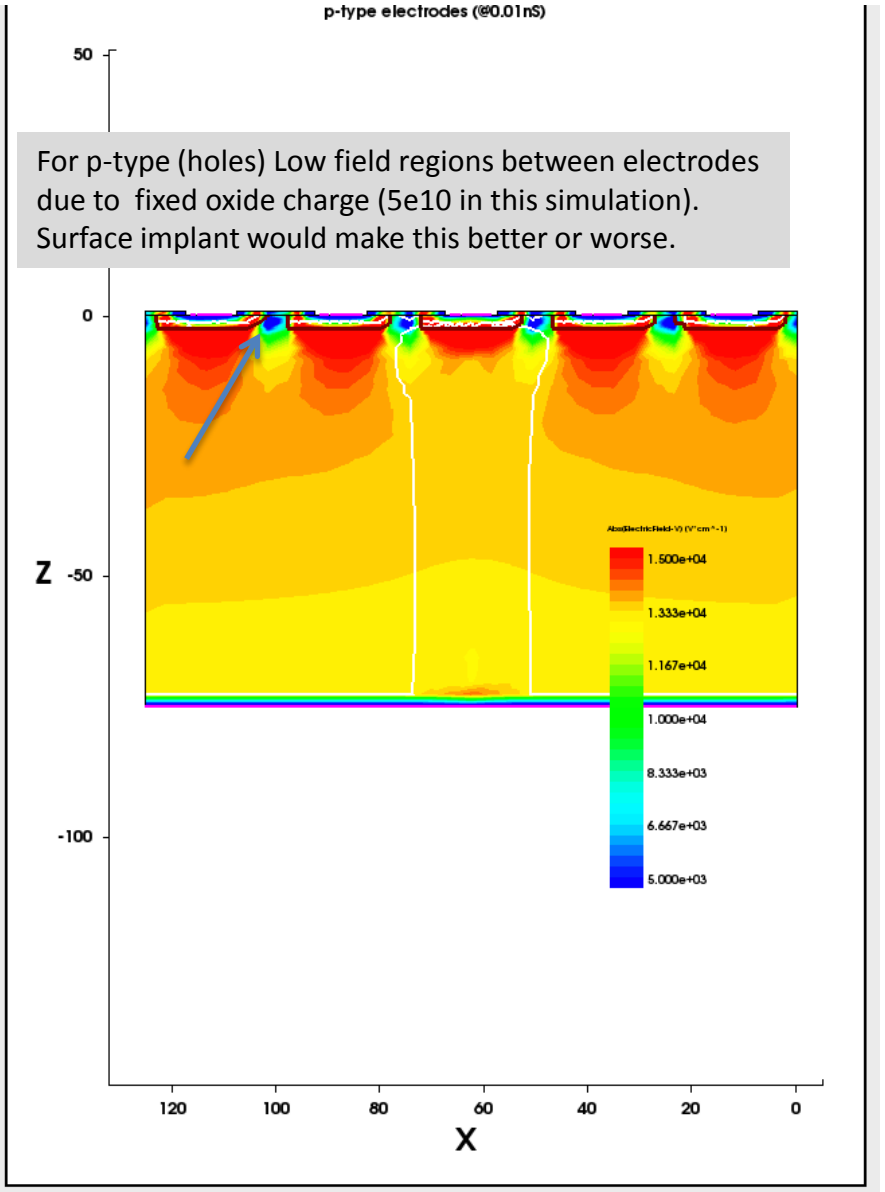


Contact Current vs. Time for 75um Thick Detector @100V for p-type vs n-type anodes (collects holes vs electons respectively)



Electric Field Cross sections





For p-type (holes) Low field regions between electrodes due to fixed oxide charge (5e10 in this simulation). Surface implant would make this better or worse.