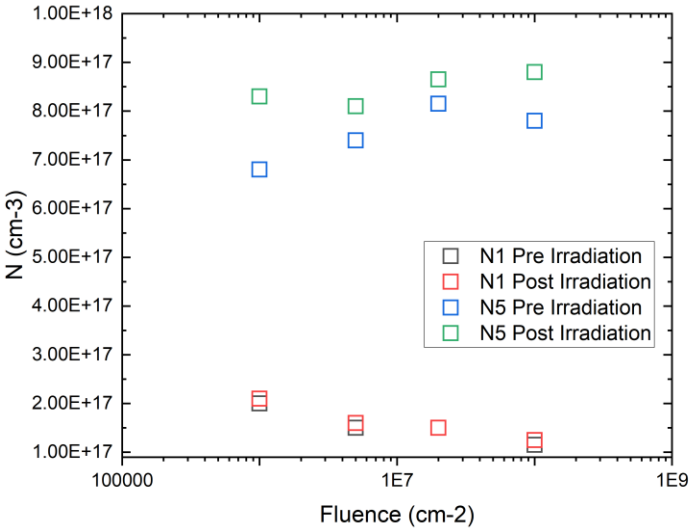



Figure 2: Hg Probe CV measurements showing carrier concentration pre and post irradiation. The increase in carrier concentration after irradiation in the higher doped sample series but not in the lower doped sample series indicates the formation or further ionization of a defect complex that is not present in lower doped samples. The formation of this defect complex is likely related to the change in fermi level as dopant concentration increases.

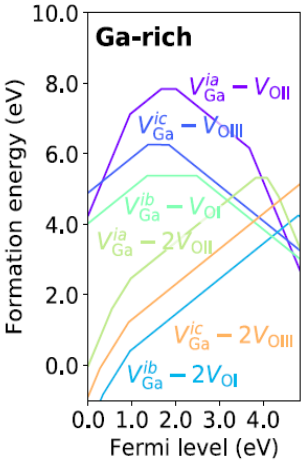
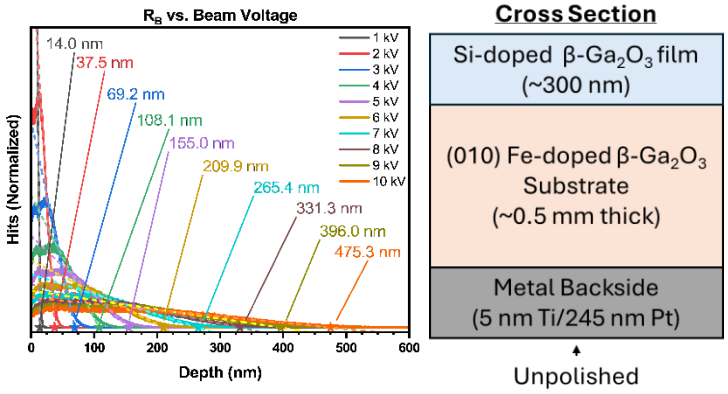



Figure 1: $Ga_2O_3$ Native defect complex formation energies. Indicating the formation of certain $V_{Ga}$-$V_O$ complex becomes more likely at higher Fermi Levels. M. E. Ingebrigtsen, et al., APL Mater. 7, 022510 (2019).




(a) (b)

Figure 3: (a) Monte Carlo simulations showing electron trajectory in β-$Ga_2O_3$ at various beam energies available in our chamber. These calculations are used to determine the DRCLS signal range in the irradiated samples as to investigate any depth dependence of defect formation throughout the film. (b) The cross section of the grown sample series, where the Si doping target was $1\times10^{17}$ and $5\times10^{17}$ $cm^{-3}$ for both sample series. The films were 300 nm and we are investigating differences in defect formation in the film and substrate.