

Abstract Submitted
for the CAL13 Meeting of
The American Physical Society

Atomic Force Microscopy (AFM) of Ion - Irradiated Cadmium Zinc Telluride Crystals¹ MADHUSUDHAN GOUNDLA, None, SAMUEL UBA TEAM — Cadmium Zinc Telluride (CZT) is considered a good candidate material for radiation detectors. However, current technology has difficulties in growing large dimension single crystals. Also, leakage (dark) currents along grain boundaries and device surface are still a big issue. In this study, we used AFM to study the changes to the surface topography of CZT crystals irradiated with Pt ions at 180 keV and 1.6×10^{11} ions/cm². The initial CZT sample is prepared by polishing and baseline AFM topographic images are taken, monitoring the values for the average roughness and root mean square. The CZT sample is then treated by etching with 2% bromine methanol (BM), followed by average roughness and root mean square AFM measurements. Next, the sample is irradiated with Pt ions and measured with AFM. The results show that the surface after irradiation has a smaller roughness and fewer morphology features than before irradiation. Current-voltage electrical measurements were also taken at each preparation stage and correlated with the AFM results. Finally, the CZT sample was assembled into a radiation detector device and its performance was tested.

¹Center of Irradiation of materials, AAMURI

Madhusudhan Goundla
None

Date submitted: 20 Sep 2013

Electronic form version 1.4