

Abstract Submitted  
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**F Center Formation in Sapphire Under Low Dose Low Energy Ar Irradiation** EMMANUEL NJUMBE, DHARSHANA WIJESUNDERA, BUDDHI TILAKARATNE, WEI-KAN CHU, TcSUH Ion Beam Lab, University of Houston — Optical spectroscopy and Rutherford Backscattering Spectrometry Channeling (RBS-C) have been used to study F center dynamics in 170 keV Ar<sup>+</sup> irradiated single crystals of sapphire ( $\alpha$ -Al<sub>2</sub>O<sub>3</sub>) at room temperature for implantation doses between 10<sup>13</sup> Ar<sup>+</sup> cm<sup>-2</sup> to 5 × 10<sup>14</sup> Ar<sup>+</sup> cm<sup>-2</sup>. F center density (N<sub>F</sub>) has been found to display an initial rapid linear increase with Ar<sup>+</sup> dose and then saturate to a maximum value of 4.02 × 10<sup>14</sup> cm<sup>-3</sup>. Fitting experimental results with a Poisson relation suggest an estimated electron capture range of 4.24 × 10<sup>-10</sup> m around an Oxygen vacancy. A possible explanation to this behaviour is presented.

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