Abstract Submitted
for the SES20 Meeting of
The American Physical Society

The angular dependence of point defects in Ga_2O_3, and how their roadmaps are used to determine the type of impurities[1] CLAUDIE NARDONE, SUMAN BHANDARI, MARY ELLEN ZVANUT, University of Alabama at Birmingham — One of the most significant new semiconductors for high power electronics is Ga_2O_3, but the success of devices depends on the type and amount of impurities incorporated during growth. In this work, electron paramagnetic resonance (EPR) is used to investigate the presence of two common impurities, Fe^{3+} and Cr^{3+}. Although the technique is ideal for detecting transition metals, the Fe and Cr signals in Ga_2O_3 can easily be confused due to the complexity of the crystal structure. To distinguish between the two, we have performed angle-dependent EPR measurement about three different crystal axes, and compared the results with known predictions for Fe^{3+} and Cr^{3+}. Using a systematic approach for evaluating contributions for each we conclude that Fe^{3+}, residing on both the octahedral and tetrahedral sites of Ga_2O_3, dominates the bulk crystal, with little contribution from Cr^{3+}. In addition, the angular rotation about the b-axis suggests the presence of second, minor, crystal rotated about 14^o about the b-axis.

[1]NSF/DMR Grant No. 1904325

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Date submitted: 19 Oct 2020 Electronic form version 1.4