Abstract Submitted for the OSF17 Meeting of The American Physical Society

Hall Effect Studies of LPCVD grown β -Ga₂O₃ on Sapphire DANIELLE SMITH, SAID ELHAMRI, Department of Physics, University of Dayton, Dayton, Ohio, ADAM NEAL, SHIN MOU, Air Force Research Lab, Materials and Manufacturing Directorate, WPAFB, OH, HONGPING ZHAO, Case Western Reserve University, Department of Electrical Engineering and Computer Science, Cleveland, OH — With its ultra-wide bandgap of 4.5-4.9 eV and large breakdown electronic field, β - Ga₂O₃ has recently attracted attention because of its potential for next generation power electronics applications. The estimated breakdown field for β -Ga₂O₃ is 8 MV/cm, much larger than 2.5 MV/cm for 4H-SiC and 3.3 MV/cm for GaN, which could enable power electronics with larger power density and greater efficiency [1]. Also, Ga_2O_3 has the potential to be more cost-efficient in mass production than other wide bandgap materials due to its ability to be synthesized through standard melt growth methods [2]. With this motivation, this study examines the electronic properties of β - Ga₂O₃ via temperature dependent Hall effect measurements. Among several samples, the highest measured mobility was $34 \text{ cm}^2/\text{Vs}$ at room temperature and $40 \text{ cm}^2/\text{Vs}$ at 150K. These results indicate the potential of LPCVD grown Si-doped Ga_2O_3 for next generation semiconductor power electronics applications. [1] Applied Physics Letters 100, 013504 (2012) [2] Applied Physics Letters 103, 123511 (2013).

> Said Elhamri Department of Physics, University of Dayton, Dayton, Ohio

Date submitted: 15 Sep 2017

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