

Abstract Submitted  
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**The Influence of Donor-Acceptor Pairs on Excitation Efficiency in GaN:Eu** BRANDON MITCHELL, Lehigh University, JONATHAN POPLAWSKY, University of Tennessee, DONG-GUN LEE, YASUFUMI FUJIWARA, Osaka University, VOLKMAR DIEROLF, Lehigh University — The nature of Eu incorporation and resulting luminescence efficiency, in GaN, has been extensively investigated. By performing a comparative study on Eu:GaN samples grown under a variety of controlled conditions, and using a variety of experimental techniques, the configuration of the majority site has been concluded to contain a nitrogen vacancy ( $V_N$ ). The nitrogen vacancy can appear in two symmetries, which has a profound impact on the luminescence and magnetic properties of the sample. The structure of the minority site has also been identified, and we further propose, and give evidence to the idea that the excitation efficiency, of both sites, is the result of a donor acceptor pair in the vicinity of the Eu.

Brandon Mitchell  
Lehigh University

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