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Saturation Behavior of Eu ion emission in GaN NATALIE HERNANDEZ, Lehigh University , BRANDON MITCHELL, University of Mount Union , YASUFUMI FUJIWARA, Osaka University, VOLKMAR DIEROLF, Lehigh University — Europium doped Gallium Nitride (GaN:Eu) has been recognized as a candidate for the red-emitting active layer in nitride-based light emitting diodes. To better comprehend the excitation energy transfer from the excited GaN host to the Eu ion, we performed an extensive analysis of GaN:Eu and GaN co-doped with Eu and other dopants (Silicon and Magnesium). We determined how various growth parameters manipulated site formations and measured the optical accessibility of the Eu ions within the GaN host and the excitation efficiency of the energy transfer between the host material and the Eu ions. Furthermore, we derived a model for the saturation behavior of the emission of Eu ions within GaN. Our results suggest that the saturation behavior is strongly influenced by different crystal growth specifications and co-dopants.

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