

Abstract Submitted
for the GEC12 Meeting of
The American Physical Society

In-situ Monitoring of Surface Modification of GaN Films Exposed to Inductively-Coupled Plasmas¹ KEIJI NAKAMURA, MIAO-GEN CHEN, YOSHITAKA NAKANO, HIDEO SUGAI, Chubu University — This paper reports in-situ monitoring of surface modification of plasma-treated GaN films based on photoluminescence (PL) technique. Irradiation of 313 nm ultraviolet (UV) light induced the photoluminescence of the GaN film, which typically consists of 365 nm luminescence caused by transition between near band edges (NBE) and broad yellow luminescence (YL) for an approximate wavelength range of 480-700 nm corresponding to defect-states-related transition before plasma exposure. However, after turning on discharges, a broad blue luminescence (BL) of 400-480 nm was also observed, and the BL intensity significantly increased, whereas the NBE and the YL decreased after the plasma exposure. The plasma-induced significant nitrogen deficiency near top surface will cause the decreases in both the NBE and the YL as non-emissive defects, and diffusion of the defects in the depth direction will attribute to the appearance of the BL. These results suggested that the PL measurements is useful for in-situ surface monitoring of plasma-treated GaN films. This work is partly supported by the 2nd stage Knowledge Cluster Initiative and Grant-in-Aid for Scientific Research (C) from the Ministry of Education, Culture, Sports, Science and Technology of Japan.

¹This work is partly supported by the 2nd stage Knowledge Cluster Initiative and Grant-in-Aid for Scientific Research (C) from the Ministry of Education, Culture, Sports, Science and Technology of Japan.

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Date submitted: 12 Jun 2012

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