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Capacitance Dispersion in GaN Grown by Molecular Beam Epitaxy MO AHOUJJA, REX BERNEY, SAID ELHAMRI, University of Dayton, Dayton OH, YUNG KEE YEO, ENP/AFIT, W-PAFB OH, UNIVERSITY OF DAYTON, DAYTON OH TEAM — GaN semiconductors are of great interest for applications in high-temperature and high-frequency electronic devices as well as blue to UV light emitting and detecting devices. However, an understanding of the role of dopants and defects in these semiconductors is essential for the realization of high performance devices. Si doped GaN samples grown by radio-frequency plasma activated molecular beam epitaxy on sapphire substrates were characterized by capacitance-voltage (C-V) measurements. The C-V measurements were performed with an LCR meter in series mode with an AC modulation level of 50 mV in the frequency range of 500 Hz to 1MHz. The junction capacitance of the Schottky diodes varied with both temperature and frequency. The variation of capacitance with frequency is known as capacitance dispersion. This dispersion is generally attributed to the slow response of deep levels to the high frequency AC signals. Consequently, it is suggested that native defects in GaN play a role in the observed capacitance dispersion.

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