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The effect of AIN buffer layer on the quality of GaN films, MOCVD grown on (111)-oriented Si substrates

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ABSTRACT

GaN films were grown by metal organic chemical vapor deposition on (111)Si substrates, using AIN as a buffer layer. The influence of the AIM buffer layer growth temperature and growth duration on the morphology and preferred orientation of GaN films was studied. Drastic enhancement of epitaxial registration was observed with increasing buffer growth temperature. A sharp transition in the growth mode occurred at 760°C. For that temperature, an optimal buffer layer growth duration was found. The use of March parameter as a figure of merit in x-ray diffraction testing of textured GaN films is proposed.