

## Polarization Properties of Deep-Ultraviolet Optical Gain in Al-Rich AlGaN Structures

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The polarization properties of the amplified spontaneous emission (ASE) in the deep-UV wavelengths from AlGa<sub>x</sub>N/AlN structures with 70% Al content have been investigated. Samples are prepared through a novel liquid phase epitaxy mode leading to strong compositional fluctuations. Large net modal gain is quantified to 230 nm after femtosecond UV optical pumping by the variable-stripe length technique. A strong transverse electric (TE)-polarization mode of the amplified emission has been demonstrated, together with an unpolarized emission giving rise to absorption only. These measurements provide an important observation in order to understand the origin of the optical gain in AlGa<sub>x</sub>N alloys with high Al content. © 2012 The Japan Society of Applied Physics