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**Selective control of polarized luminescence from GaN/AlN self-assembled quantum dots** DANIEL RICH, OFER MOSHE, Ben-Gurion University, BENJAMIN DAMILANO, JEAN MASSIES, Centre National de la Recherche Scientifique — GaN/AlN self-assembled quantum dots (QDs) were grown by the Stranski-Krastanov method on Si(111) using molecular beam epitaxy. During the subsequent cooling from growth temperatures, the thermal expansion coefficient mismatch between the Si substrate and GaN/AlN film containing vertically stacked QDs leads to an additional biaxial tensile stress at the Si/III-Nitride interface. We have modified the thermal stress in the QD layers by etching stripes of varying widths using inductively coupled Cl/Ar plasma reactive ion etching. The results show that a suitable choice of stripe width and orientation can create regions of in-plane uniaxial stress ranging from 20-30 kbar which enables a selective and local control of polarized emission from the QDs. Localized cathodoluminescence (CL) spectroscopy of the QDs exhibits emissions from both the ground and excited states, whose relative contributions depend on the level of excitation and temperature. We have studied these emissions using time- and polarization-resolved CL for ensembles of QDs. The effects of screening of the polarization field in the QD, state-filling, changes in the polarization anisotropy and lifetime with varying excitation were studied experimentally and modeled with a self-consistent 6x6 k.p calculation method.

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