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Optical properties of AlGaN/AlGaN microcavities containing GaN quantum wells OLEG MITROFANOV, STEFAN SCHMULT, MICHAEL MANFRA, MICHAEL SERGENT, Bell Labs, Lucent Technologies, RICHARD MOLNAR, Lincoln Lab, MIT — The large oscillator strength and binding energy of excitons in GaN make GaN based microcavities attractive for studies of light-matter coupling. Lattice mismatch within the family of Nitride alloys, however, results in formation of many extended defects, which degrade optical quality of heterostructures and substantially increase inhomogeneous broadening of excitons. We will discuss optical properties of AlGaN/AlGaN microcavities for the spectral region around 350 nm grown by molecular beam epitaxy on thick GaN templates. The structural quality of the microcavities is maintained by compensating the compressive and tensile strains in the layers of the distributed Bragg reflectors (DBR). This approach results in the lowest elastic strain energy and allows the growth of thick coherently strained DBRs with reflectivity higher than 99%. We will present photoluminescence studies on GaN quantum wells incorporated inside microcavities and discuss exciton-photon coupling.

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