Abstract Submitted
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Giant Excitonic Transport in GaN/AlGaN Surface Quantum Wells[1] Y.D. GLINKA[2], Department of Physics, University of Texas at Austin, Austin, TX, S.V. GOUPALOV[3], T.V. SHAHBAZYAN, Department of Physics, Jackson State University, Jackson, MS, H.O. EVERITT[4], U.S. Army Aviation and Missile RDEC, Redstone Arsenal, AL, J. ROBERTS, P. RAJAGOPAL, J. COOK, E. PINER, K. LINTHICUM, Nitronex Corporation, Raleigh, NC — A huge progressive spatial expansion of photoluminescence (PL) area over a few 100 μm with decreasing the GaN/$Al_{0.2}Ga_{0.8}N$ surface quantum well width in the range of 2.9 - 1.51 nm has been observed by focusing 4.66 eV laser light (170 fs pulses) into the spot on the sample surface. The out-of-spot PL spectra reveal higher energy bands which are separated from the free exciton peak by multiples of optical phonon energy. The effect is explained as a dipolar excitonic explosion followed by nonequilibrium-optical-phonon-mediated lateral transport. The PL is observable due to radiative recombination of high-energy excitons accompanied by inelastic scattering with surface ionized acceptors.

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