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Light emission from zinc oxide nano-forest THOMAS P. CAPUANO, LUCA LUCERA, ALEXANDER G. AGRIOS, ALI GOKIRMAK, HELENA SILVA, University of Connecticut — Zinc oxide nanorods were grown on patterned highly doped silicon microstructures ($\sim$ 2-10 μm long) through a chemical bath deposition technique. Homogeneous and uniform coverage was obtained, with the length of the nanorods of $\sim$ 2 μm and diameter of $\sim$ 150 nm. When microsecond pulses (up to 50V) were applied across the microstructures, very bright and intense flashes of blue-white light were obtained. The output spectra, acquired with a high sensitivity spectrometer ($\approx$ 1 nm FWHM), showed sharp peaks in the UV range (330-334 nm) and high-intensity peaks in the blue range (467-480 nm), matching Zn atomic transitions, and broad emission from 450 nm to 800 nm, suggesting formation of a plasma. The voltage generated by the emitted light on a photosensitive PIN diode placed close to the sample and the electrical current through the sample were captured simultaneously using an oscilloscope to correlate the electrical and optical responses and determine the times of the plasma's generation and power dissipation.

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