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Directional and magnetic field enhanced emission of Cu-doped ZnO nanowires/p-GaN heterojunction light-emitting diodes

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Abstract

The electrochemical deposition technique was used for the preparation of Cu-doped ZnO-nanowire-based emitters. Nanowires of high structural and optical quality were epitaxially grown on p-GaN single crystalline film substrates. We found that the emission is directional with a wavelength that is tuned and redshifted toward the visible region by doping with Cu in nanowires. Furthermore, Cu-doped ZnO-nanowires show an enhancement of the transition probability under magnetic field.