



# Guided mode lasing in ZnO nanorod structures

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## Abstract

Quasi-two-dimensional arrays of nearly parallel hexagonal ZnO nanorods and a three-dimensional cylindrical microstructure consisting of ZnO nanorods have been grown by low pressure chemical vapor deposition (CVD) and carbothermal evaporation technologies, respectively. The technology ensures high optical quality of the produced nanostructures so as to act as a gain medium for stimulated emission in the ultraviolet spectral region in combination with high quality factor laser resonators. Multiple sharp lasing peaks were realized from the produced structures under nanosecond pulse optical excitation. The lasing peaks display successive onset and saturation with increasing excitation power density in accordance with the lasing behavior of guided modes in ZnO nanorods. The produced structures are expected to find applications in integrated nanoscale optoelectronics, photonics, and sensor technologies.