

Green Semiconductor Vertical-Cavity Surface-Emitting Lasers based on Quantum Dots

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Abstract

Green VCSELs emitting in the spectral range from 491.8 nm to 565.7 nm, covering most of the ‘green gap’, are demonstrated. These devices are featured with low threshold current and CW lasing at room temperature. A few technologies such as laser liftoff of sapphire substrate, the removal of high-defect GaN buffer and Cu plating to increase the heat dissipation. Two dielectric DBRs were adopted as the cavity mirrors. The results presented here open up opportunities to design and fabricate semiconductor green lasers with excellent performance that may lead to wide-gamut, low consumption power and compact displays and projectors. The VCSELs could also be bonded on to Si for integration with other optoelectronic devices/circuits.

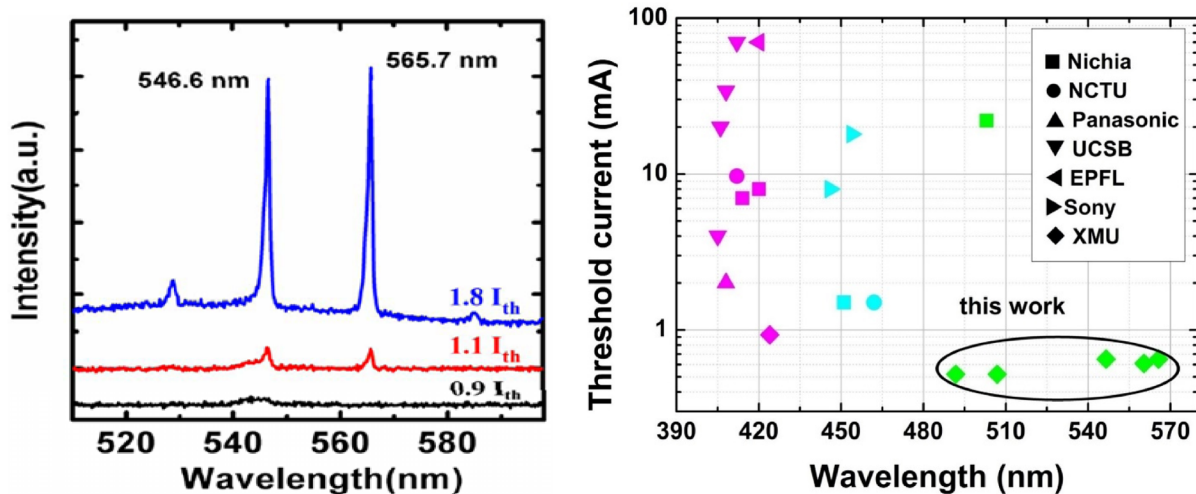


Figure 1. Lasing spectra (left) in this work and comparison (right) of threshold currents with literatures.

References

[1] Y. Mei; G. E. Weng; B. P. Zhang; J. P. Liu; W. Hofmann; L. Y. Ying; J. Y. Zhang; Z. C. Li; H. Yang; H. C. Kuo, Quantum dot vertical-cavity surface-emitting lasers covering the ‘green gap’. *Light: Science & Applications*. 6, e16199 (2017). doi:10.1038/lsa.2016.199

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