

Does the slit in a GaN microdisk affect WGM lasing mode?

In addition, we corroborate the experimental lasing spectra with the simulated light fields and emission directions to compare the GaN microdisks without or with the slit. Our study finds that the slit in the disk affects the WGM lasing mode, emission direction, Q factor, and lasing threshold.

What is the FWHM of a GaN microdisk with a slit?

As for the floating GaN microdisk with a slit, two clear laser modes can be observed, which disappear at excited power densities above 240 kW/cm^2 . The center position of the strongest lasing peak is 376.03 nm and the FWHM is 0.2 nm . At an excitation power of 240 kW/cm^2 , the Q factor of the highest peak is about 1800.

What is a high quality microdisk?

High quality (Q) factor microdisks are fundamental building blocks of on-chip integrated photonic circuits and biological sensors. The resonant modes in microdisks circulate near their boundaries, making their performances strongly dependent upon surface roughness.

Are microdisks operating in WGM?

The center position of the strongest lasing peak is 376.03 nm and the FWHM is 0.2 nm . At an excitation power of 240 kW/cm^2 , the Q factor of the highest peak is about 1800. Considering the Q factors and cavity structure, the data in Fig. 2 suggests that the microdisks are operating in WGM.

What is a gain medium for a microdisk?

Gain medium for III-V WGM microlasers The first injection lasers of microdisk geometry were based on a GaInAsP-InP quantum wells (QWs), with diameter of $9 \text{ }\mu\text{m}$ and a lasing wavelength of $\sim 1.58 \text{ }\mu\text{m}$. Those lasers operated at a temperature of 300 K and were demonstrated back in 1992.

What is a single mode microdisk laser?

Mode selection Single-mode operation of the microdisk laser is highly desirable for practical applications, for instance for data transmission in optical integrated circuits as well as for optical sensors. However, the width of the gain spectrum is usually much broader than the free spectral range of a microdisk.

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