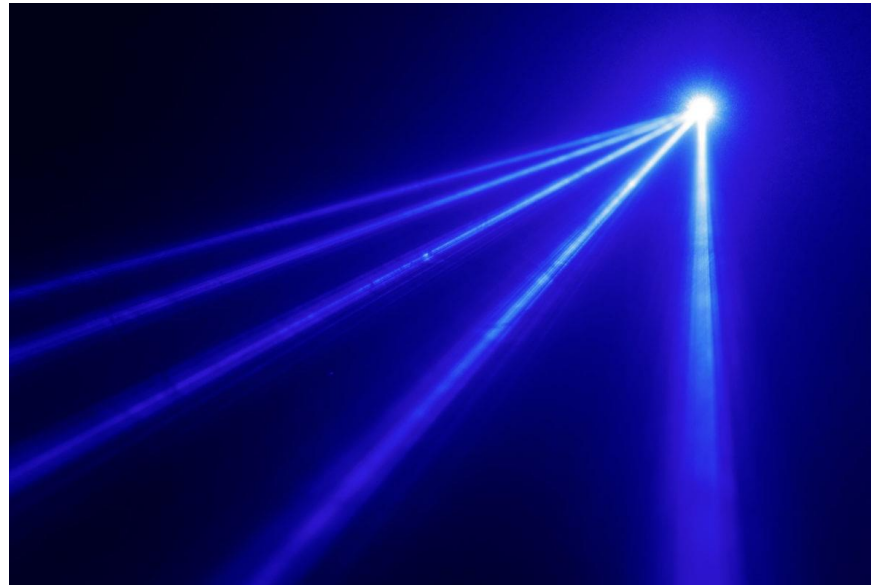
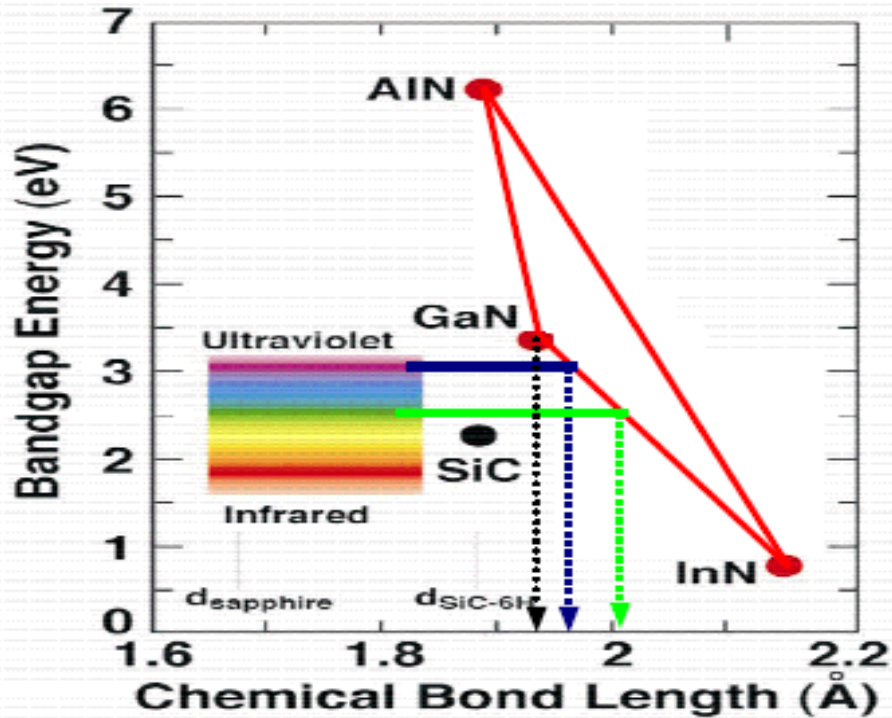


Blue & UV GaN laser diodes

By S. P. Najda

TopGaN Ltd., ul. Sokolowska 29/37, 01-142 Warsaw, Poland.

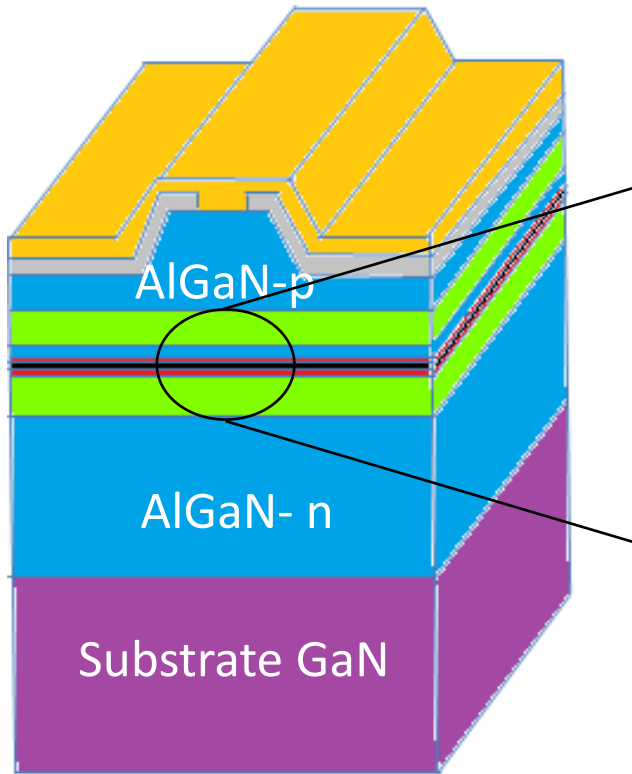




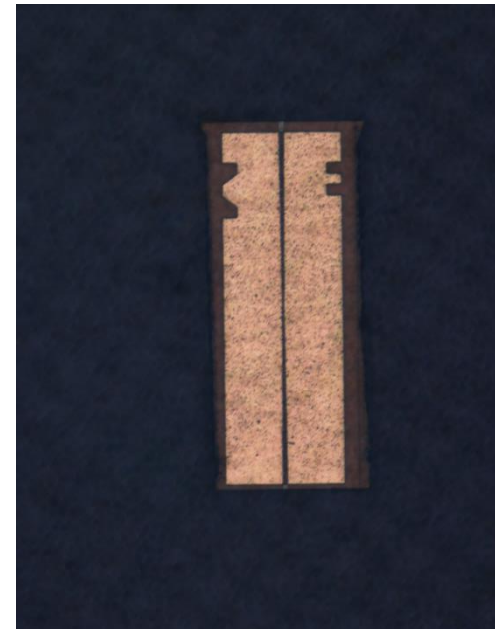
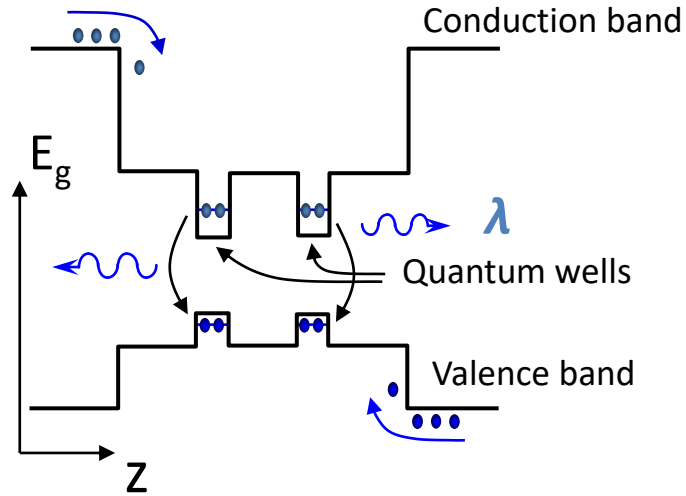
The AlGaInN material system allows lasers diodes to be fabricated from the u.v. (~370nm) to visible (~530nm).

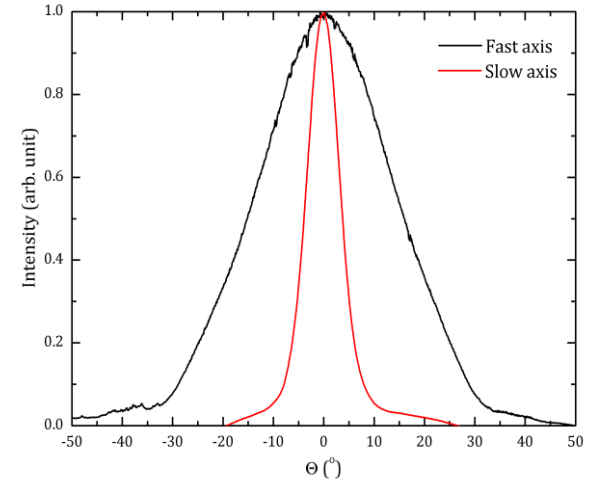
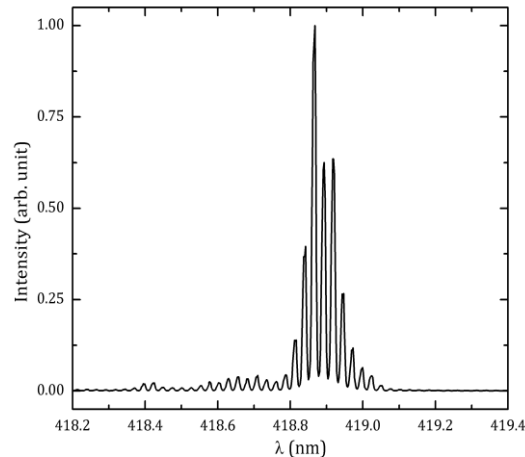
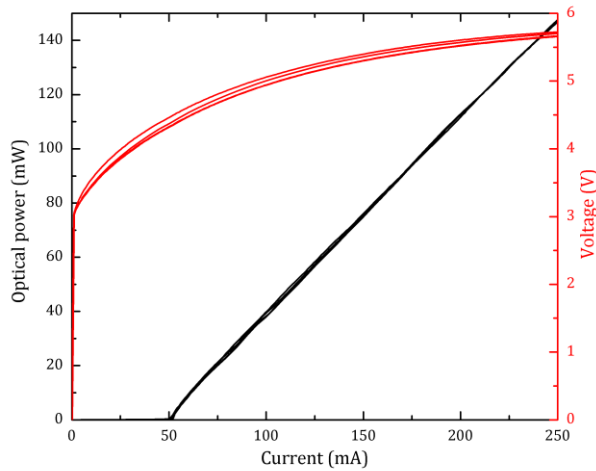
TopGaN advantages:

- GaN substrate
- MOCVD & MBE epitaxy.
- Single mode operation



Active region of $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{In}_{0.02}\text{Ga}_{0.98}\text{N}$ quantum wells with $x=0.05-0.2$





AlGaInN 420 nm laser diode characteristics, a) LIV , b) far-field, c) spectral output.

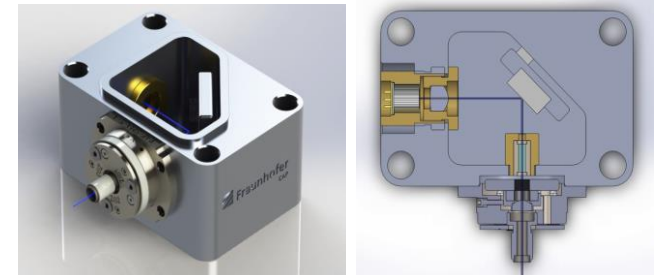
GaN laser diodes:

- Small, robust, cost effective source
- Very narrow linewidth (MHz)
- High power (50mW)

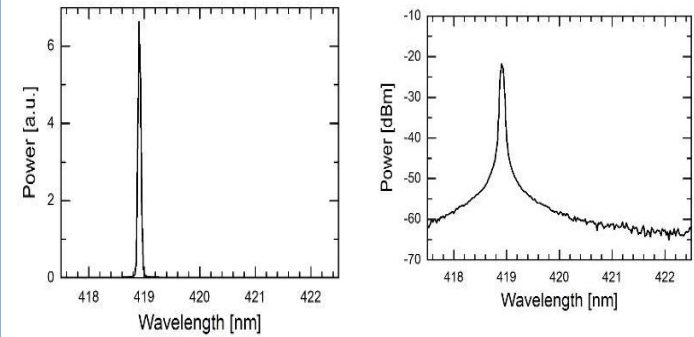
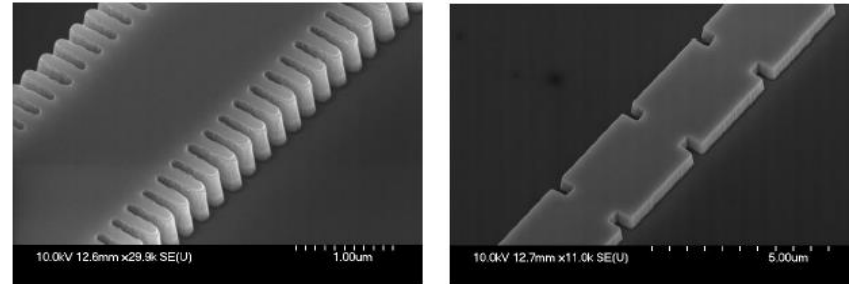
GaN Laser Technology: Line narrowing

Quantum technologies require line-narrowing (<1MHz):

- 1) Extended cavity GaN laser diode

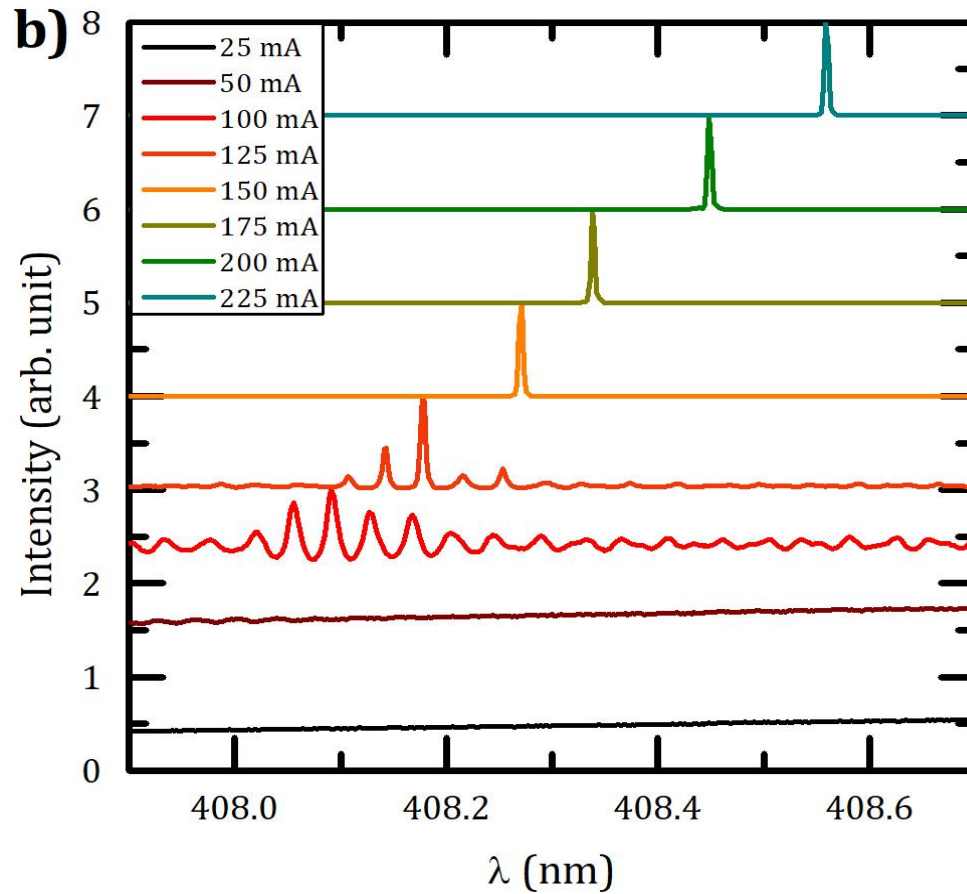


- 2) DFB-like structure with lateral grating



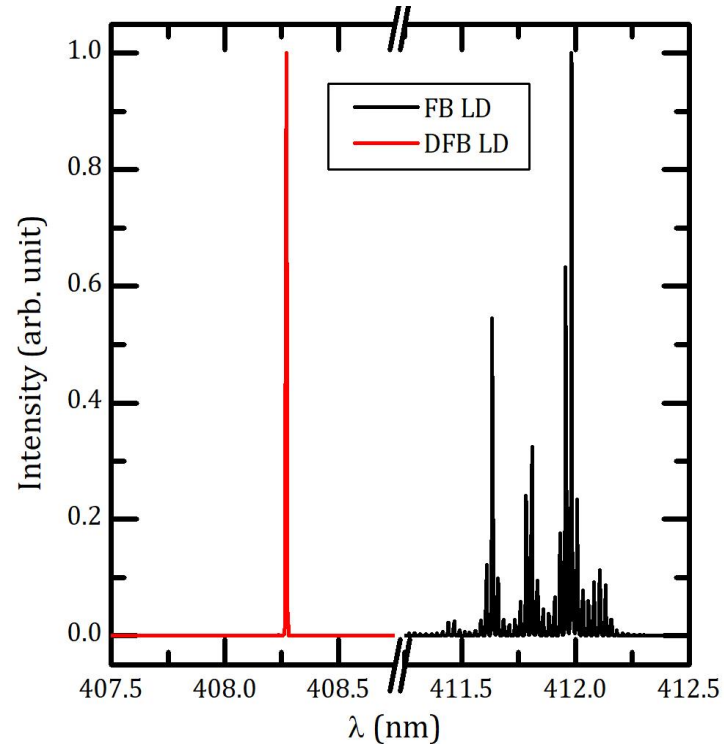
Spectral output of ECDL at 40mW

2) DFB-lateral grating GaN laser diode:
Spectra vs drive current



Emission spectra for a range of drive currents.

2) DFB-lateral grating GaN laser diode:
GaN DFB vs FP spectral output



Comparison of the spectrum between the standard FP LD and DFB laser diode for driving current $I = 150$ mA.