

Lasing Reporting Summary

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ü Experimental design

Please check: are the following details reported in the manuscript?

1. Threshold

Plots of device output power versus pump power over a wide range of values indicating a clear threshold Yes No Using the given parameter of the device. Beijing LAJAMIN LASER Co., LM-UVY-5S-Y

2. Linewidth narrowing

Plots of spectral power density for the emission at pump powers below, around, and above the lasing threshold, indicating a clear linewidth narrowing at threshold Yes No Using the given parameter of the device. Beijing LAJAMIN LASER Co., LM-UVY-5S-Y

Resolution of the spectrometer used to make spectral measurements Yes No Using the given parameter of the device. Beijing LAJAMIN LASER Co., LM-UVY-5S-Y

3. Coherent emission

Measurements of the coherence and/or polarization of the emission Yes No Using the given parameter of the device. Beijing LAJAMIN LASER Co., LM-UVY-5S-Y

4. Beam spatial profile

Image and/or measurement of the spatial shape and profile of the emission, showing a well-defined beam above threshold Yes No Using the given parameter of the device. Beijing LAJAMIN LASER Co., LM-UVY-5S-Y

5. Operating conditions

Description of the laser and pumping conditions Yes No In the Characterization measurements of Methods.
Continuous-wave, pulsed, temperature of operation

Threshold values provided as density values (e.g. W cm⁻² or J cm⁻²) taking into account the area of the device Yes No In the Characterization measurements of Methods.

6. Alternative explanations

Reasoning as to why alternative explanations have been ruled out as responsible for the emission characteristics Yes No Using the given parameter of the device. Beijing LAJAMIN LASER Co., LM-UVY-5S-Y. No modification of emission characteristics has been put forward for the good performance devices.

e.g. amplified spontaneous, directional scattering; modification of fluorescence spectrum by the cavity

7. Theoretical analysis

Theoretical analysis that ensures that the experimental values measured are realistic and reasonable Yes No We have fabricated a large number of devices with good performance under stable (single) and simple laser parameters. No obvious difference between devices has been found. The stable laser parameters and consistency of devices guaranteed the reliability of the data. So no strict requests for the device to do some theoretical analysis.
e.g. laser threshold, linewidth, cavity gain-loss, efficiency

8. Statistics

Number of devices fabricated and tested Yes No Owing to the reliable and stable performance of the device, we use a series fabricated devices to test, and there are no obvious difference between them, so there is no strict requests from statistics.

Statistical analysis of the device performance and lifetime (time to failure)

- Yes
- No

The device remains good performance after 3000 cycles, about 5 days, so there is no statistical analysis.