

Lasing Reporting Summary

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• 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

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

Resolution of the spectrometer used to make spectral measurements Yes No

3. Coherent emission

Measurements of the coherence and/or polarization of the emission Yes No

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

5. Operating conditions

Description of the laser and pumping conditions *Continuous-wave, pulsed, temperature of operation* Yes No

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

6. Alternative explanations

Reasoning as to why alternative explanations have been ruled out as responsible for the emission characteristics *e.g. amplified spontaneous, directional scattering; modification of fluorescence spectrum by the cavity* Yes No

7. Theoretical analysis

Theoretical analysis that ensures that the experimental values measured are realistic and reasonable *e.g. laser threshold, linewidth, cavity gain-loss, efficiency* Yes No

8. Statistics

Number of devices fabricated and tested Yes No

Statistical analysis of the device performance and lifetime (time to failure) Yes No

