

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

The laser in Raman Microscope (Alpha300 R) is a commercial product. Its threshold information doesn't pertain to our test and can be obtained from the manufacturer (WiTec) upon reasonable request.

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

The laser in Raman Microscope (Alpha300 R) is a commercial product. Its linewidth narrowing information doesn't pertain to our test and can be obtained from the manufacturer (WiTec) upon reasonable request.

Resolution of the spectrometer used to make spectral measurements

☒ Yes
☐ No

Supplementary Information, Supplementary methods, page 9.

3. Coherent emission

Measurements of the coherence and/or polarization of the emission

☐ Yes
☒ No

Irrelevant to our experiment.

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

Irrelevant to our experiment.

5. Operating conditions

Description of the laser and pumping conditions
Continuous-wave, pulsed, temperature of operation

☒ Yes
☐ No

Supplementary Information, Supplementary methods, page 9.

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

The laser in Raman Microscope (Alpha300 R) is a commercial product. It provides a 35 mW power output at 633 nm, yet the power density is unknown and not necessarily needed to perform the experiment.

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

Irrelevant to our experiment.

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

Irrelevant to our experiment.

8. Statistics

Number of devices fabricated and tested

☐ Yes
☒ No

Irrelevant to our experiment.

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

☐ Yes
☒ No

Irrelevant to our experiment.

