

Interactive comment on “Cavity-enhanced photoacoustic sensor based on a whispering-gallery-mode diode laser” by Yufeng Pan et al.

Anonymous Referee #1

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In this manuscript, the authors reported on a very interesting experiment. They implemented an ultra narrow diode laser as exciting source and photoacoustic module coupled with optical build cavity, thereby realizing a cavity-enhanced photoacoustic sensor. To validate the sensor system they selected acetylene as gas target. The authors demonstrate that the cavity-enhanced photoacoustic module was able to increase the photoacoustic signal by a factor of 166 that is comparable with the the power enhancement factor of 175. This result is very interesting for the gas sensing community and the manuscript deserves publication once a few small revisions will be made.

List of revisions:

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1) How to switch the diode laser to a different band? By changing its temperature. In this case please show the temperatures related to the different curves shown in Fig.1

2) On page 3 line it should be better described the differential nature of the PAS cell. I suggest the following text: "The gas flow noise and external acoustic disturbances can be effectively suppressed by using a custom transimpedance differential preamplifier. The signal coming from the microphone located in the acoustic resonator not illuminated by the laser beam is subtracted from the one related to the microphone located in the excited resonator and the resulting signal is subsequently amplified.

3) The text on page 3 lines 19-22 describing Fig. 4 should be located after the text describing figure 3b.

4) On page 4 line 28 remove the words: "The parameters of"

5) On page 4 line 31 use certified instead of verified

6) the noise level reported on page 5 line 12 contains too much digits, it should be $6.6 \mu\text{V}$. The same for the signal value reported on page 5 line 14. Better report $7.37 \mu\text{V}$ and claim a SNR of 1,110.

7) In the reference list the reference: Patimisco et al, published on Analyst the correct year is 2015 (not 2014).

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