

# ***Interactive comment on “N<sub>2</sub>O isotopocule measurements using laser spectroscopy: analyzer characterization and intercomparison” by Stephen J. Harris et al.***

## **Anonymous Referee #3**

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The paper is a well designed experiment that investigate and compare the use, the performance, and the calibration of several instruments that measure N<sub>2</sub>O isotopes using laser spectroscopy. Stable isotope measurements of atmospheric N<sub>2</sub>O have largely increased in the last years due to the use and spread of these laser isotope analysers (from different manufacturers) in both field and lab conditions. However, it is sometimes unclear how the amount of data produced can be interpreted and compared among studies since several analytical issues has been raised. I believe this paper is timely and brings some light to many of these issues and will become a baseline text for people to get future directions into this fast-growing field. In general, I really enjoyed reading the paper since it is well written and the experimentation results are shown in

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an order manner. I only have some very minor comments for the authors to consider.

### Specific

I noticed that in some places might be confusing if the authors do not specify that this is of direct application in atmospheric measurements. It is kind of obvious but when general conclusions are discussed like in Page 63 (L10-21), this will not hurt to make their statements clearer to the reader. I can easily think in other applications using laser spectrometers like the stable isotope measurement of dissolved nitrate, which is ultimately, transforms to N<sub>2</sub>O for analysis. For instance, these applications have provided some approaches on the dependence of isotopic measurements on N<sub>2</sub>O concentration; but as mentioned in the text, these might use standardized gas matrix for injection into the laser analyser.

The main text is relative long and I hope the authors can move some details to the Supplementary Information.

### Technical corrections

Please explain the coefficients in Figure 1. (e.g.  $\times 10^2$ ). What is the carrier gas in Figure 2? Suggest that the units in Table 6 are specified. It would be much easier to compare different laser spectrometers if the same scale is used for each parameter in Figure 4.

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Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2019-451, 2019.

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