

## Comment on amt-2021-276

Anonymous Referee #2

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Referee comment on "IRIS analyser assessment reveals sub-hourly variability of isotope ratios in carbon dioxide at Baring Head, New Zealand's atmospheric observatory in the Southern Ocean" by Peter Sperlich et al., Atmos. Meas. Tech. Discuss., <https://doi.org/10.5194/amt-2021-276-RC2>, 2021

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The authors tested the performance of an Isotope Ratio Spectrometer to measure CO<sub>2</sub>, δ<sup>13</sup>C and δ<sup>18</sup>O in CO<sub>2</sub> in the lab and field. The authors also developed a calibration method for the DR system. This is a carefully done study. The result will be very important to the manufacturer and users.

### General comments

- Although the careful and precise style is important for scientific papers, the thrifty compactness of construction is more necessary, this manuscript is too long.
- The order of the figure numbers should be adjusted as the content. At the same time, there are too many figures in the manuscript and some of them are repeated.
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### Specific comments

- Line149, you mean you applied directly one-point calibration scheme with Q1, and assessed the instrument fluctuations with the results of Q2 and Q3 as target? Did you do some tests with two-point calibration?
- Line170-172, Please explain how you decided the flush time and injection time, and add the time resolution of the DR

- Line306, as the basic introduction of the station, section 5.1 should be brief and general.
- Line347, if possible, section 5.2 can be combined with section 7.2 to help readability.
- Line 392 and Fig. 6, didn't you try to change another test gas? Afterall, Q2 is very important in your scheme with notably different CO<sub>2</sub> mole fraction and isotope ratio from Q1 and Q3.
- Line714, the authors need to provide suitable references or test data for "δ<sup>13</sup>C-CO<sub>2</sub> measurements using air from glass flasks showed that <sup>13</sup>C-CO<sub>2</sub> was drifting with lowering pressure in the flask".
- Fig.4, the authors should provide legends in the figure.
- Fig.10, the middle and bottom panels sent the same information
- Fig.16, the bottom panel of the time series is unnecessary.