Comment on amt-2021-276
Anonymous Referee #2

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

The authors tested the performance of an Isotope Ratio Spectrometer to measure CO2, δ13C and δ18O in CO2 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.

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 CO2 mole fraction and isotope ratio from Q1 and Q3.
- Line 714, the authors need to provide suitable references or test data for “δ13C-CO2 measurements using air from glass flasks showed that 13C-CO2 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.