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Atmospheric Measurement Techniques Discussions

Interactive comment on "Jena Reference Air Set (JRAS): a multi-point scale anchor for isotope measurements of CO_2 in air" *by* M. Wendeberg et al.

Anonymous Referee #2

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This is a good summary of much work that has been performed by the authors in an attempt to establish an internationally accepted "scale" for the measurement of stable isotopes in atmospheric CO2 that is accessible to the broader community. I think this work, and the JRAS flasks, will find much interest from the "stable isotope" community, as evidenced by the 13 laboratories that volunteered to participate in this study.

However, I have two major comments, and several other comments, for the authors to consider.

The authors need to address the apparent discrepancy between the number of partic-

ipants and the results presented. Specifically, on P6628 L16 the authors mention 11 laboratories as receiving the JRAS gases but on P6631 L8 they state that 13 laboratories volunteered to participate. The 13 laboratories are listed in Table 1. The numbers should be made consistent (13?) or the reason for the difference explained. Also, this leads to the question: "Why are results presented for only 6 laboratories?" (Tables 2 and 3, and Figures 4 and 5). Is there a reason that results are presented for fewer than half the laboratories? Is it because no results were reported, or was it that they did not agree with, or did not differ from, the results obtained from the other laboratories? This should be explained.

In two places, the abstract (P6628 L6-8) and P6633 L5-8, the authors cite the 16th WMO CO2 Experts Meeting as the source of a recommendation concerning the use of JRAS but there is no reference provided. This must be a verifiable statement, please supply a reference.

Other comments. P6628 L6. The sentence beginning "Now" would be better as "Ten years later, at the 2011 CO2-Experts-Meeting in Wellington, it was recommended that the Jena Reference Air Set (JRAS) become the official scale anchor for isotope measurements of CO2 in air". "Now" is 2012, eleven years later. (And provide the reference).

P6628 L10. I'm not sure how the "stability and longevity of the CO2" is safeguarded by being generated from calcites. Could this be explained further? Perhaps starting as "The source of CO2 used for JRAS is two calcites"; this could mention the calcite stability and how the CO2 can be generated.

P6629 L28 (footnote). GS20B would be "one of the two" pure CO2 canisters (L1).

P6630 L7. Are the physical characteristics of the second calcite (OMC-J1) similar to those of MAR-J1? If not, do the authors foresee any problems with storage or preparation that might arise from the differences? It seems to me that it would be more important that OMC-J1 and MAR-J1 be similar to each other, rather than NBS 19, for

the “stability and longevity” of JRAS.

P6630 L12. Does “enough material can be prepared and stored without risk of isotopic alteration” refer to the CO2 in air samples (JRAS)? Are there any risks that isotopic alteration can occur to the JRAS flasks, or evidence that it does not?

P6630 L22. “. . . the preparation variability is not propagated . . .”. I gather this means that the assigned values do not need to have any additional preparation variability propagated into their uncertainty assignment as the calibration is made against the primary calcites NBS 19 and LSVEC. This might be easier to follow if the next paragraph, starting L24, was moved before the sentence starting “Figure 1” on L18.

P6632 L26. “Factors contributing . . .” Does this mean that the correction for N2O affects d18o uncertainty values more than d13c uncertainty values? Perhaps this section could be expanded upon if this is the case.

Interactive comment on Atmos. Meas. Tech. Discuss., 5, 6627, 2012.