

## ***Interactive comment on “Comparison of continuous in-situ CO<sub>2</sub> observations at Jungfraujoch using two different measurement techniques” by M. F. Schibig et al.***

**Anonymous Referee #2**

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The paper is describing three years (2010–2012) of in-situ CO<sub>2</sub> measurements at Jungfraujoch Station performed by two types of analyzers (NDIR and CRDS). The description of the measurements and comparison of both time series is clearly explained, but would need additional details in some parts. I do recommend the manuscript for publication in AMT after some revisions proposed listed below.

General remark: the averaged difference between NDIR and CRDS is 0.04 +/-0.4 ppm, or a little bit higher depending on the cutoff used to reject highly variable data from the time series. However this difference is variable over time and I would like to see more analysis of this variability. For example in Spring 2012 it seems that the CRDS is

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systematically higher than NDIR by about 0.2 ppm during a couple of months. Could you provide the difference on a monthly basis? Also there were some changes in the setup of the measurement (change of the NDIR sensor in 2011, and of the CRDS one in 2011; moving from dry to wet air for the CRDS measurements). It would be interesting to evaluate if the CO<sub>2</sub> differences are similar or not for the periods corresponding to these different setup.

7054 (25): Allowing additional time?

7057 (10): Could you precise the level of temperature/pressure regulation you have for the NDIR instrument?

7058 (20): you mention the measurement of a target gas to detect short term changes, but you don't present any result from this gas. How do you use this information?

Tables 2 and 3 provide the assigned values of the calibration tanks for NDIR and CRDS. You should precise in the legend that the values are assigned by central lab at Univ. of Bern and EMPA respectively. These intermediate steps between NOAA and the stations may introduce a bias. Have you performed any cross-comparison between the two central labs?

7064: after the correction of the non-linearity of the NDIR you should reduce the bias of the target gas (H1, 440ppm) compared to its assigned WMO value by about 0.35 ppm. Is it what you observe?

7065 (6): how do you estimate the 0.12 ppm accuracy of the standard measurements?

7065 (22): I am not fully convinced by the attribution of the trend differences (0.2 ppm) to the assigned values of the working gases. Could you elaborate this discussion?

7067: 'independent comparison measurements': again I am surprised that you don't mention the use of the target gas which should be there to evaluate problems with the calibration scale.

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