

Interactive comment on “A fully Automated Dobson Sun Spectrophotometer for total column ozone and Umkehr measurements” by René Stübi et al.

Anonymous Referee #2

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A fully Automated Dobson Sun Spectrophotometer for total column ozone and Umkehr measurements René Stübi, Herbert Schill, Jörg Klausen, Eliane Maillard Barras, and Alexander Haeferle

Initial Comments: This submitted manuscript would fit in the category of a commentary, as it describes the modernization of an existing measurement program. I recommend publication after the issues below are addressed. Technical corrections are in the supplement file

Specific Comments/Questions:

I am not commenting on the details of the automation and electronics, as I am not
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currently experienced in this field.

Introduction: A reference to the history of the discovery of ozone depletion by chlorofluorocarbons (CFCs) is expected. The discovery of the Antarctic ozone hole by Dr. Solomon (<https://doi.org/10.1038/d41586-019-02837-5>) is a good source for the history. Suggest a lead-in sentence similar to: The history of the detection of the ozone layer depletion is one of the most important scientific stories of the 20th century (Solomon, 2019). Line 20: The term “calibrate” is not correct. This paragraph should be re-written. The various ground-based and space-based networks have independent calibration methods. Data results from the various instruments and networks are inspected and intercompared to detect problems within networks. I believe that authors are also saying that the algorithms used to convert data to total ozone values are evolving with increased understanding of the instrument characteristics, and the assumptions used in the measurement and data reduction algorithms. Line 25: There should be some mention of the development of the instrument for the early 1900s’ studies in Stratospheric Circulation.

Dobson measurement principle and instrument design: Table 1: Why is there no A-pair wavelength values for D062 or FWHM values for D062 or D051?

3.4 Automation of instrument tests There are other processes in the operation of a Dobson observing program. One of which is determining the attenuation curve of the optical attenuator. Has there been an attempt to automate this process?

Page 14, line 10: Larger changes are normally a sign of either an aging lamp or a change in the instrument response and are corrected by an update of the attenuator calibration curve. A better explanation is required. The data reduction algorithm incorporates the changes in the standard lamp test values from the lamp values determined at the time of the instrument’s calibration by comparison to a reference instrument. The attenuator calibration curve is determined by a different procedure. The standard lamps are actually reference lamps, with measured values for a certain

Dobson instrument on a specific date. The change in the measured values with time indicates aging of the instrument. Use of multiple lamps on varying time schedules allows for detection of aging lamps.

Please also note the supplement to this comment:

<https://amt.copernicus.org/preprints/amt-2020-391/amt-2020-391-RC1-supplement.pdf>

Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2020-391, 2020.