

Supplementary material for

Sixteen Years of Measurements of Ozone over Athens, Greece with a Brewer Spectrophotometer

Kostas Eleftheratos ^{1,2,*}, Dimitra Kouklaki ¹ and Christos Zerefos ^{2,3,4}

¹ Department of Geology and Geoenvironment, National and Kapodistrian University of Athens, 15784

Athens, Greece; dkouklaki@geol.uoa.gr

² Biomedical Research Foundation of the Academy of Athens, 11527 Athens, Greece; zerefos@geol.uoa.gr

³ Research Centre of Atmospheric Physics and Climatology, Academy of Athens, 10680 Athens, Greece

⁴ Navarino Environmental Observatory (N.E.O.), 24001 Messenia, Greece

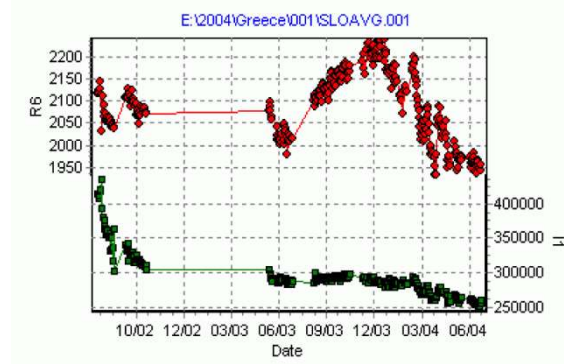
* Correspondence: kelef@geol.uoa.gr; Tel.: +30-210-7274133

We provide here information about the stability of the Brewer spectrophotometer in Athens according to the Standard Lamp ratio R6, obtained from the results of the calibrations of the instrument that were held in Athens, Greece, in 1) 2004, 2) 2007, 3) 2010, 4) 2013 and 5) 2019.

(1) Calibration 2004: SL ratio R6

Other Test Results:

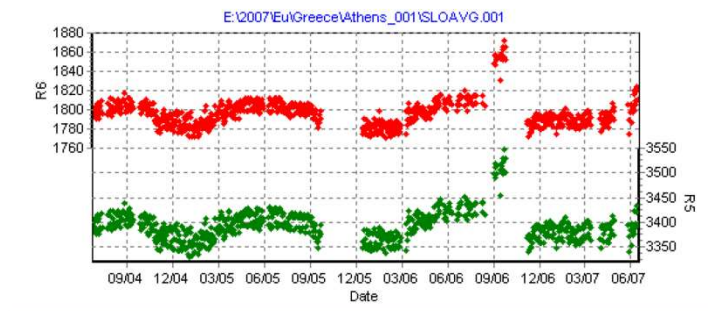
Sun scan tests identified that the cal step operating wavelength setting of 158 was still satisfactory. The dispersion test using mercury and cadmium lamp lines was completed and the resulting constants were very close to 2002 constants (file dcf20202.001) in use. The neutral density filters were measured with TESTFW2 and FI routines. Below is the SL R6 ratio and FI counts and SL CI scans before and after the filter was changed. Note the increase in sensitivity of 260% after the change.



(2) Calibration 2007: SL ratio R6

Other Test Results:

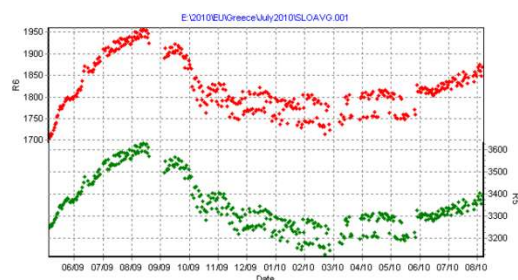
Next is graph of the uncorrected SL ratios R6/R5 for past 3 years, which show the shift last September, and some seasonal temperature dependence. The dispersion test using mercury and cadmium lamp lines was completed and the resulting constants were very close to 2002 constants (file dcf20202.001) in use and so no changes were necessary. The neutral density filters were measured with FI routine.



(3) Calibration 2010: SL ratio R6

Other Test Results:

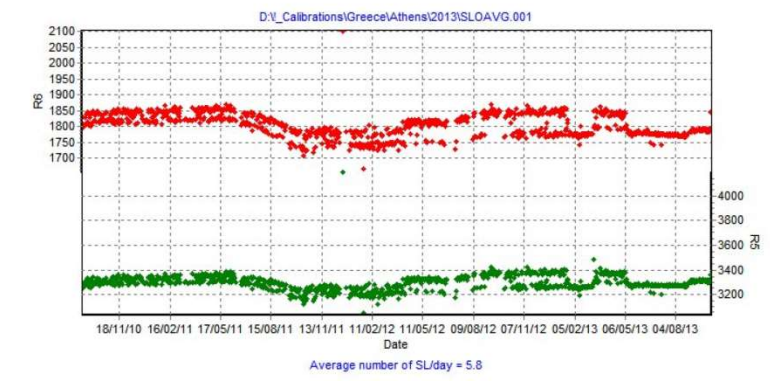
Next is graph of the SL ratios R6/R5 for the past year, which shows unusual variability every 1-3 days for 1 year from June 2009. The dispersion test using mercury and cadmium lamp lines was completed and the resulting constants were different by ~6 steps at each wavelength to the file in use (file dcf19704.001) and so the new file (dcf25310.001) was put into use. The neutral density filters were measured with FI routine and results show lower values for first 2 filters than desired.



(4) Calibration 2013: SL ratio R6

Other Test Results:

Next is a graph of the SL ratios R6/R5 for the past 2 years, which shows two lines of values until 2013. The shifting was traced to the FW3 positioning from one day to the next. Note the improved results after the FW3 was disabled early in the 2013. The dispersion test using mercury and cadmium lamp lines was completed with the new HG reference and the new ZERO constant and so the new file (dcf28013.001) was put into use.



(5) Calibration 2019: SL ratio R6

Other Test Results:

Next is a graph of the SL ratios R6/R5 for the past 6 years, which shows a significant change.



Figure S1. Information about the stability of the Brewer spectrophotometer according to the calibrations of the instrument in 1) 2004, 2) 2007, 3) 2010, 4) 2013 and 5) 2019.