Atmos. Chem. Phys. Discuss., 15, C5692–C5694, 2015
www.atmos-chem-phys-discuss.net/15/C5692/2015/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Updated ozone absorption cross section will reduce air quality compliance" *by* E. D. Sofen et al.

Anonymous Referee #1

Received and published: 6 August 2015

The authors consider the impact that adoption of the revised value for the 253.65 nm ozone absorption cross-section recently re-measured by (Viallon et al., 2015) would have on regulatory monitoring in the U.S., Canada, and the E.U. This cross-section is 1.8% lower than the standard value (Hearn,1961) currently used in UV absorption photometers, and implies that previously reported ambient concentrations should accordingly be increased by 1.8%. They discuss the ramifications of this change and suggest alternative scenarios for dealing with the impacts. They further note that most studies of health impacts have also been based on ozone concentrations determined by the same method.

The authors suggest that adopting the new cross-section value would have serious implications for regulatory agencies. They illustrate this with maps showing how the

number of monitoring stations in exceedance of the current standards would increase in the U.S., Canada, and the E.U. if the reported concentrations were adjusted to reflect the new cross-section value. For the U.S., they conclude that 179 of the 2326 monitoring stations active between 2010 and 2012 did not meet the 2008 EPA standard of 0.075 ppm for that period, and assert that an additional 33 monitors would not have met the standard if the new cross-section were adopted. Certainly, an 18% increase in the number of monitors out of compliance has serious ramifications, but this number strikes me as an overestimate arising from the methods used to calculate both the current and hypothetical design values (DV) for the U.S. monitors, i.e. the 3-yr average of the 4th highest maximum daily 8-h average concentration (MDA8), which are different from those used by the EPA.

The current (2008) 8-h primary and secondary National Ambient Air Quality Standards (NAAQS) in the U.S. are 0.075 ppm, expressed to the third decimal place. The current NAAQS rule (40 CFR Parts 50 and 58 [EPA–HQ–OAR–2005–0172; FRL–8544–3] RIN 2060–AN24) states: "... in calculating 8-hour average O3 concentrations from hourly data, any calculated digits beyond the third decimal place would be truncated, preserving the number of digits in the reported data." Similar procedures are used when calculating the 3-yr averages and different results can be obtained if these rounding and truncation conventions are not adhered to. For example, Figure 1a erroneously shows a filled red circle in SE Arizona corresponding to the monitor at the Chiricahua National Monument, which according to the EPA had a 2012 DV of 0.073 ppm. The new cross-section would increase this DV to 0.074 ppm, which still does not exceed the standard. The same is true for Seiling, OK, the northwestern most point in that state, which is also represented by a filled red circle in Figure 1a. The 2010-2012 DV at Death Valley National Park, near the border between California and Nevada, would only increase from 0.072 to 0.073 ppm, removing another red point from the plot. There are, no doubt, other examples arising from the averaging methods used by the authors and similar considerations are likely to apply for the data from Canada and the E.U. These inconsistencies should be corrected before the article proceeds further since

the significance for regulatory monitoring hinges on these results.

Interactive comment on Atmos. Chem. Phys. Discuss., 15, 19537, 2015.