Atmos. Chem. Phys. Discuss., 4, S3189–S3190, 2004
www.atmos-chem-phys.org/acpd/4/S3189/
European Geosciences Union

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Column ozone and aerosol optical properties retrieved from direct solar irradiance measurements during SOLVE II" *by* W. H. Swartz et al.

Anonymous Referee #1

Received and published: 3 January 2005

This is a great paper. It describes the implementation and application of an important technique by an obviously extremely competent and careful group of investigators. It is beautifully and clearly written, and was a sheer pleasure to read. It should certainly be accepted for publication after a few minor corrections.

I have no significant criticisms, but I will list a few minor items, including one where I think the work could actually produce another useful result. In order of occurrence:

Introduction: A few more words on proxy maps would be useful. I have not heard the term before, but it seems obvious from the context what they must be. Who makes

them, and for what constituents?

2.1 Please state what the higher order effects of Rayleigh scattering would be for this FOV at the shortest wavelength utilized for analyses, in order to demonstrate that it is negligible.

2.1 It is not completely clear from the paper whether any iteration is involved in the LOS composition profile for O3 when chi-squared is being minimized.

2.1, line 23: " ... contributions to the extinction that manifest THEMSELVES ...."

3.1.1, line 5: " ... determine THE direct solar UV ...." Also, which laboratory carried out the calibration?

3.2 and Figure 3: There is a potentially very interesting conclusion, if the fitting statistics actually bear it out, that the UV and visible measurements of O3 agree to 1%. I am surprised that the cross sections agree to better than 2% (please also note explicitly the source of the Chappuis band cross sections in MODTRAN in the footnote to Table 2). Is it possible that there are offsetting errors from cross section intercalibration and refraction (Section 4, first paragraph)? The 1% precision noted in 4.5.1 also is significant in this regard. A positive conclusion could be important for satellite measurements of O3, including profiles and tropospheric O3.

Figure 6. Find a way to make the AATS-14 vs. DIAS results more visible.

Interactive comment on Atmos. Chem. Phys. Discuss., 4, 7403, 2004.