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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Influence of clouds on the spectral actinic flux density in thelower troposphere (INSPECTRO): overview of the field campaigns" *by* S. Thiel et al.

Anonymous Referee #1

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This is a good summary of the very impressive suite of measurements made during the INSPECTRO field campaigns. The paper contains very little new science and it is acceptable for publication only because it is part of the INSPECTRO special issue. Particularly useful is the collected technical information about many radiometric instruments. A few minor comments/suggestions follow.

Title and throughout the text: Why actinic flux "density"? The standard usage is simply actinic flux. There is already confusion in the nomenclature (e.g. fluence rate, spherical irradiance, scalar flux), so adding a new name will not help.

13420/10: A more original reference is Nack, M.L. and A.E.S. Green, Influence of

clouds, haze, and smog on the middle ultraviolet reaching the ground, Appl. Opt. 12, 2405-2415, 1974.

13421/7-10: This sentence is a bit misleading. Were the deviations really due to using 1-D model instead of 3-D model? Or simply because the vertical distribution of aerosol optical properties was not known? This should be stated more precisely or removed.

13424/12: Is shading from balloon a problem?

13432/23-25: Don't all actinic flux instruments allow calculation of J values? The more useful information is that a full spectral scan was completed in xx seconds (2 seconds?).

13442/18: Here, a 1.1x1.1 km2 resolution is called "high";, while on lines 12-13 a 1x1 km resolution is called "coarse." Please clarify, and also decide on km2 vs. km.

13442/21: might want to explain why, e.g. "...under overcast conditions (when ground-based instruments such as the Brewer could not determine the O3 column)."

13443/20: "which could technically be parameterized" - was it, or not?

13443/21-23: does this refer specifically to BRDF? Not clear as stated.

13443/24: This is a case where the word "precision" is clearly better than "accuracy", since accuracy also refers to the realism of the situation, e.g. are the model inputs really representative of the actual environment?

13444/1-2: It seems strange that the agreement between 1D and 3D models is better than the MYSTIC statistical uncertainty, and suggests that the statistics may have been done incorrectly.

13444:14-17: of course, this method will run into some troubles in boxes/layers that have no absorbers at the wavelength of interest (division by zero). Presumably the code has some protection against this?

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13446/8-10: the seasonal variation of peroxy radicals is a poor proxy for the very well known seasonal variation in UV radiation. Suggest deleting this sentence.

13454/19-21: presumably this increase is ABOVE or IN the clouds.

Table 1: What is meant by cloud amount? Is it fractional area coverage?

Editorial suggestions: 13421/3: replace "Beneath" with "In addition to" 13426/26: replace "lead" with "led" 13429/23: Units should include Watts (W m-2 nm-1) 13434/23: "data mining" is redundant 13434/26: replace "make" with "makes" 13435/3: delete "resulting from radiant fluxes" (redundant, and what exactly is a radiant flux?) 13435/8: what is meant by "high level"? can delete? 13436/23: replace "(That is solid)" with "(i.e. solid)" 13437/20: replace "was" with "were" 13442/11: replace "data was" with "data were" 13442/27: replace "were" with "was" 13445/4: place a comma "," after algorithm 13445/26: meaning of acronym APOLLO was already defined at 12442/15-16. 13448/9: the sentence "...agree within the uncertainty limit where they coincide." seems odd. Perhaps "...agree within the uncertainty limit at wavelengths where they overlap." 13453/2: replace "were" with "was" 13453/9: replace "agree" with "agrees" Fig.7, titles on top of panels should read "photolysis frequency" not "flux density" Fig. 9 caption: replace "airborned" with "airborne". Also "turkoise" with "turquoise"

Interactive comment on Atmos. Chem. Phys. Discuss., 7, 13417, 2007.

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