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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Photolysis frequencies in water droplets: Mie calculations and geometrical optics limit" *by* B. Mayer and S. Madronich

Anonymous Referee #1

Received and published: 7 October 2004

General comments:

The paper focuses on the enhancement of the actinic flux density within water droplets as compared to the surrounding air. The authors resolve discrepancies between the results of two earlier studies based on Mie theory and geometrical optics limit, respectively. This is a very valuable contribution and I strongly recommend this paper for publication.

I have only a few minor comments regarding the structure of the paper.

1. The authors might think about the title. In my opinion the title is a bit misleading because no photolysis frequency but the actinic flux density within droplets is calculated.

2. It is unclear to me why the discussion on the absorbtion due to dissolved molecules

is part of section 2.1 entitled 'Geometric optics'. It should rather be a part of a section dicussing absorption properties and/or photolysis frequencies of several species.

3. Furthermore, I would suggest to have a separate subsection on the dicussion of the resonance since it is a mayor part of the paper.

Specific comments:

Page 4109, line 9/10 and 13/14, 'pi r**2 is the geometric...': is repeated.

Page 4110, line 21: Eq. 8 and Fig. 4 are refered to though not yet discussed. It is always difficult to understand such references. Please try to avoid it.

Page 4114, line 17: 'Interestingly', it is only by chance, isn't it?

Appendix A, page 4115: Perhaps a schematic showing the angles and directions would help to understand. In that case repetitions would not be necessary (e.g., definition of Theta)

Page 4121, line 12: please explain precisely what is integrated, e.g., give equation number.

Page 4122, line 5: 'combining all eq. ....' please give reference to respective equations.

Technical corrections:

Page 4117, line 16: correct 'next'

Page 4119, line 21: correct 'absorved'

Page 4121, line 18, middle eq.: d phi is missing.

Interactive comment on Atmos. Chem. Phys. Discuss., 4, 4105, 2004.

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Interactive Comment