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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Simulation of solar radiation during a total solar eclipse: a challenge for radiative transfer" *by* C. Emde and B. Mayer

Anonymous Referee #2

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General comments The paper presents a backward Monte Carlo algorithm for 3D radiative transfer, modeling in spherical geometry. It is adequate for publication in ACP. The model is clearly described with all aspects. It has been validated against other models with high quality and by modeling the solar radiation inside the umbral shadow during a solar eclipse. The last has the advantage of high accuracy of model input data. The results show irradiances and zenith radiances modeled for the eclipse in March 2006. All features are explained, including limb darkening and corona effects and the consequences of the photon paths and aerosol load, both for absolute values and for their spectral behavior. Thus the paper gives a very good inside into the processes during the solar eclipse. The related work is properly discussed, the figures are clear and in the right quantum.

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Specific comments In abstract, introduction and in conclusion the authors mention their hope that their results are helpful to optimize observations during future solar eclipses. This aspect I do not understand. It should be omitted or explained. Figs. 5 and 8 should show the same area Figure 16 is nice, but nothing more. It is not necessary to demonstrate the results.

Technical corrections Last line before Chap 3: Say "...be taken into account" instead of "..not be neglected." For other technical corrections see comment of referee 1

Interactive comment on Atmos. Chem. Phys. Discuss., 7, 499, 2007.