Geoscientific
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Interactive comment on "Photolysis rates in correlated overlapping cloud fields: Cloud-J 7.3" *by* M. J. Prather

Anonymous Referee #1

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General comments

Numerical predictions of cloud effects on photolysis rates are uncertain. The author presented a new modeling approach to calculate the photolysis rates including the effects of cloud overlapping and the treatment of VOCs. The work conducted in this paper may contribute to improve the atmospheric chemistry models. I have a few questions and comments to improve the clarification of the paper.

Specific comments

Abstract

A brief explanation is needed to understand why "four quadrature atmospheres" yields "an average of 2.8 Fast-J calls".

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p.4056, l.2: More explanation is needed for the vertical correlation of cloud layers. How did you derive the equation (10) from the statistics? How did you consider horizontal correlation between neighbor grids? How does this method depend on the grid resolution?

p.4058, l.12: Please explain "mod".

p.4059, l.20: Could you explain more why cc = 0.33 is the best? It is likely that the correlation coefficient depends on grid resolution.

Technical corrections

I needed to correct the character length of TITCLD to compile the code, which did not work due to segmentation fault.

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