Atmospheric Chemistry and Physics Discussions

Interactive comment on "Averaging kernels for DOAS total-column satellite retrievals" by H. J. Eskes and K. F. Boersma

Anonymous Referee #3

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In this paper, the widely used Rodgers formalism is applied to a specific domain: the retrieval of total columns of atmospheric trace species by the UV-visible DOAS technique. A mathematically sound derivation of the DOAS total column averaging kernel is provided under the assumption of optical thin atmosphere, that is valid in a large part of the UV-visible region.

The main interest and also the main focus of the Eskes and Boersma manuscript is to stress once again the importance of taking properly into account the altitude-dependent sensitivity of any column or profile measurement (in particular the UV-visible nadir total column measurements that are concerned by the present discussion) when using them for further interpretation works like model comparisons, ground validation, etc.

One of the main aims of the authors as explicitly stated in the conclusions is, to en-

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courage the DOAS community to provide on a more systematic basis the averaging kernel information that is associated with the retrieved column data products. In other words, this means that retrieval groups are encouraged to provide a full description (in terms of averaging kernels) about their knowledge of the atmospheric parameters that influence the retrieval process. This means not only the trace gas vertical distribution but also other important parameters like albedo, aerosol content, etc. Since with the DOAS technique, all the atmosphere-related dependence of the retrieval is lying in the AMF calculation, this is in practice equivalent to provide users with measured slant columns and calculated -vertically resolved- AMFs.

Interactive comment on Atmos. Chem. Phys. Discuss., 3, 895, 2003.

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