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Interactive Comment

Interactive comment on "A global climatology of total columnar water vapour from SSM/I and MERIS" *by* R. Lindstrot et al.

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Dear authors,

You mention in subsection 3.1.2 (P.67, L.20) the k-distribution of Bennartz and Fischer 2000. I wanted to give some precisions about this method, and explain why you are totally right to use it because it does not have the disadvantages of the classic k-distribution method regarding the precision.

The particularity of this k-distribution method (presented firstly in Bennartz and Fischer 2000 [1] and detailed in Doppler et al. 2014 [2]) is that the correlation approximation is not used: All the layers of the atmosphere can have different spectrum of gas absorption, and the k-distribution algorithm find a distribution of bins (k-intervals) that will

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be tested for all the layers of the atmosphere. This leads to a gain of precision (but increases the computation time) compared to the "correlated k-distribution methods", traditionally used (Lacis and Oinas 1991 [3]), that suppose s (correlation approximation) that the spectra of gas absorption of different layers of the atmosphere are correlated.

Ref:

(1) Bennartz R, Fischer J. A modified k-distribution approach applied to narrow band water vapour and oxygen absorption estimates in the near infrared. J Quant Spectrosc Radiat Transfer 2000;66:539–53

(2) Doppler L, Preusker R, Bennartz R, Fischer J. k-bin and k-IR: k-distribution methods without correlation approximation for non-fixed instrument response function and extension to the thermal infrared. Applications to satellite remote sensing. J of Quant Rad Transfer 2014;133:382-395.

(3) Lacis AA, Oinas V. Nongray Gaseous Absorption, Thermal Emission, and Multiple Scattering in Vertically Inhomogeneous Atmospheres. J Geophys Res 1991;96(D5):9027-9063.

Interactive comment on Earth Syst. Sci. Data Discuss., 7, 59, 2014.