

Interactive comment on “Fast reconstruction of hyperspectral radiative transfer simulations by using small spectral subsets: application to the oxygen A band” by A. Hollstein and R. Lindstrot

L. Doppler

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Dear author,

You refer to k-distribution in the introduction of your paper: "... replacing line by line absorption calculations by k-bin or ESFT techniques (e.g., Wiscombe and Evans, 1977; Bennartz and Fischer, 2000)" (P.8341, L.6-8).

Note, that k-bin is not the general terminology that is used to describe k-distribution technique. k-bin is a special method of k-distribution presented in Doppler et al. 2013 (a), specially developed for remote sensing with instruments with non-fixed spectral

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response function (in Doppler et al. 2013, this k-bin method is applied for the example of O2-A band remote-sensing with OCO-2).

Also, you cite Bennartz and Fischer, 2000 for the k-distribution. This is relevant because many articles about remote sensing that you cite use the method of Bennartz and Fischer 2000. Nevertheless, note that the method of Bennartz and Fischer 2000 is an advanced k-distribution method. For k-distribution in general, it is more relevant to cite a more general reference, namely Lacis and Oinas, 1991 (b).

I would like to suggest you the following sentence if you want to discuss about k-distribution and k-bin techniques: "... replacing line by line absorption calculations by ESFT techniques (e.g., Wiscombe and Evans, 1977), k-distribution techniques (e.g. Lacis and Oinas 1991), advanced k-distribution or k-bin methods (Bennartz and Fischer, 2000; Doppler et al. 2013)"

References:

(a) Doppler L, Preusker R, Bennartz R, and 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 Quant Spectrosc Radiat Transfer* (2013), <http://dx.doi.org/10.1016/j.jqsrt.2013.09.001>

(b) Lacis AA, Oinas V. Non gray gaseous absorption, thermal emission, and multiple scattering in vertically inhomogeneous atmospheres. *J Geophys Res* 1991; 96(D5):9027–63.

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