

Interactive comment on “The effect of horizontal gradients and spatial measurement resolution on the retrieval of global vertical NO₂ distributions from SCIAMACHY measurements in limb only mode” by J. Pukite et al.

Anonymous Referee #2

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General comments:

This paper is well-written, and contains a well-constructed study concerning the effect of horizontal gradients on retrieval of NO₂ profiles. The results are useful, and should apply readily for numerous other species (not limited to NO₂). My questions relate to details that would help me understand the paper better.

Specific comments:

Sect. 2, 1st paragraph: It would be helpful to specify who "our group" is.

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Sect. 2, 2nd paragraph: Since Deutschmann (2009) is not readily available to most readers, could you briefly describe the difference between the McArtim model and the Tracy-II model, and how these differences affect (or fail to affect) the results of this study?

Sect. 2.3, 2nd paragraph: Interpolation is mentioned in several places, but the nature of the interpolation attempted is not specified. Is it linear interpolation? Of what quantity? (Number density, mixing ratio, etc.)

Sect. 3.1, 5th paragraph: It's a little unsettling that such a large fraction of the regions shown in Figs. 4-5 are cross-hatched (retrieval error > gradient effect). However, I suppose the (presumably) random nature of the retrieval error allows useful information to emerge from the picture even in the cross-hatched regions.

Technical comments:

Sect. 4.2.2, 4th paragraph: I think this should read: "In analogy to Figs. 8 and 10, Fig. 17 shows..."

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