

Interactive comment on “Instantaneous variance scaling of AIRS profiles using a circular area Monte Carlo approach” by Jesse Dorrestijn et al.

Anonymous Referee #2

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Overall / general comments

The paper presents a circular area Monte Carlo approach to assess scale invariance properties and scale breaks from AIRS measurements. Overall the paper is very well written but the statistics and correlations showed here are not always convincing. This is a promising technique but it needs to be applied to more data and to acknowledge the poor correlations observed in section 4.5 (and more data will help with correlations). Also, why sometimes the authors use α and sometimes β ? β is generally more known, especially when it concerns the well-known $-5/3$ value. There is no such reference for α . I suggest using β throughout the whole manuscript for consistency reasons.

Minor comments: Abstract Line 2: 13.5km is not really what I call “high spatial resolution”

tion". May be "higher" is better for the comparison with 45 km.

Introduction: Line 18: Please add also the reference: Kolmogorov, A. N.: "Dissipation of Energy in the Locally Isotropic Turbulence", Proceedings of the USSR Academy of Sciences (Russian), translated into English by Kolmogorov, Andrey Nikolaevich (8 July 1991), 23, 16–18, 1941.

2.2 Line 9: Why Retrieval System have their first letter in capital?

Figure 3: Please increase text/label font size It would be interesting to highlight (using arrow, line, marker, etc) the position of the scale break for each case. It would be more easy for the reader to see if there is a common off-set between the AIRS-xxx in the 4 locations.

Figure 4c: The large decreasing of standard deviation as a function of the length scale in the case AIRS-OE need to be more developed. This slope catches the eye directly when looking at the figure. This is probably due to small scale processes that are "resolved" with the higher resolutions but it should be mentioned.

4.5 Line 13: To me well-correlated is above 0.80, we can argue that the fig 10a is close to this value but then the correlation decrease. It becomes dangerous to me to talk about correlation below 0.7. This is especially true for water vapor where the values are too low. I can be simpler to remove WV from this plot and keep temperature only.

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Discussion paper

