

Reviewer #2
Second Review:

To the authors:

Please, you need to understand that theory is one thing and hypothesis is a different scientific element. The so called MO similarity hypothesis is just a hypothesis not a THEORY. This hypothesis proposes that the set of non-linear equations you are using are valid only under homogenous surfaces and stationary flows. – please correct all instances in which MOST is mistaken and replace by MO hypothesis.

Going to your response #4 basically your answer is circumventing the question and what you are indicating is that the blending height will give you a safe interval to indicate the you are above all internal boundary layers that can be generated in the XLAS footprint and therefore you use either way the equations. But you had never demonstrated that this is the case. More importantly blending heights are defined including aerodynamic characteristics and no stratification is accounted for. So please make sure or provide example calculations to ensure you are above the blending height assuming this blending height is defined under conditions in which mechanical turbulence is larger than buoyancy driven turbulence.

Response #8 is missing.

Detailed comments:

#21: your answer still does not address the problem of distributed parameters. We agree on all those references you mentioned but you are still not given a convincing argument about using a model with concentrated parameters (R, V, I) over a problem that contains distributed parameters (roughness, soil temperatures, canopy temperatures, air temp, vapor pressure etc). Please give a reasoning to convince the reader that this model despite being a concentrate parameters model it represent distributed parameters of the land surface characteristics.

#36 here I refer to the numerical convergence of the set of MO + CN2 equations that you solve at each step when you input CN2, Tamb, Pamb and Bowen Ratio to deduce H_XLAS. Now this is called iterative method. The article mentioned is an advanced version of how to articulate all the equations MO + CN2 and obtain H_XLAS through an analytical computation. This has nothing to do with the G. Also what I mentioned about SNR of CN2 has to do with the convergence factor in the traditional iterative calculation method for H_XLAS retrieval. You are right about CN2(z) this is explained in the article of Paulson that gives the sensitivity to terrain height since CN2 varies strongly and non-linearly with height. But my question here is about the numerical methodology you are using to integrate all equations each 30 min. based on the set of MO + CN2 equations.

37 please then clarify this in the text.

#43: this needs to be demonstrated. You should provide at least an example analysis that no advection is present. Remember that advective flows or the presence on site of submeso flows can erase the scale gap in which all micromet observations are based on. And that this condition will put atmospheric surface layer flows outside the conditions of MO Hypothesis in which all your deductions are based. Please take a look at papers from Foken as I mentioned before.

