

## ***Interactive comment on “Tomographic retrieval approach for mesoscale gravity wave observations by the PREMIER Infrared Limb-Sounder” by J. Ungermann et al.***

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I am glad to see that the authors are willing to reword the statement under discussion. However, I am afraid that the new wording is still misleading. “...updated sequentially using in each step only information contained in single profiles or limb-scans...” is not correct for several reasons: First, sequential estimation uses at each step all information available by then, the actual measurement as information in the measurement space, the information of prior limb scans as information in the atmospheric state space. During each step both these sources are combined to find an optimal update of the full 2D state vector. Second, the term ‘single profiles or limb scans’ is somewhat

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vague, because it is not clear what ‘single profiles’ are. The sequential estimation approach chosen by Steck et al. definitely does not handle single profiles of atmospheric state variables but the full 2D field. Do the authors mean ‘**radiance** profiles’? Third, the use of the term ‘each step’ is ambiguous and misleading; in the context of sequential estimation it refers to the loop over the limb scans. What do the authors mean with ‘each step’ in the context of their own simultaneous inversion? To mention the loop over iterations here in this context would be misleading because also sequential estimation involves an (inner) loop over iterations. I suggest to change the wording as follows: “Please note that we do not apply the approach of Steck et al. (2005), where the full 2D state vector is updated sequentially by using in each step the radiance information provided by one additional limb-scan, but perform a simultaneous update using all available measurement information in a single step.”

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