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

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I am glad to see that the work on tomographic retrievals is further pursued. However, it seems that the authors have misunderstood the paper by Steck et al. (2005). The approach described there is not based on individual profiles as stated on p 2822 line 3 of Unger mann et al., but is a retrieval of the full 2D state vector, exactly as in the approach of Unger mann et al.. The term ‘sequential’ in Steck et al. refers only to the fact that the measurement information is – contrary to the Unger mann et al. approach – exploited limb-scan by limb-scan. During each of these steps, however, the entire 2D field is optimized, and the knowledge on the 2D state vector $x$ gained in prior steps...
is conserved by using the $x$-field of the $i$th step as $x_a$ (i.e. the a priori) of the $i + 1$st step, and the $S_x$ of the $i$th step as $S_a$ of the $i + 1$st step. The advantage of this decomposition is a significantly reduced dimension of the $F'$ matrix with respect to number of measurements to be considered during each step.