Dear authors,

the paper is nearly ready for final publication. Some issues still have to be resolved before acceptance of the paper. The explanation of the DFS given in the author's reply is confusing and needs to be improved.

The DFS is one of three possible definitions of the information content, according to Rodgers. In your reply, you describe the Shannon's information content, which varies between 0 and 1. Value of 0 at a given altitude means that your measurement does not provide any information for this altitude (retrieval usually returns the a-priori value), while 1 means full information content from the measurement.

The DFS, another definition of information content, specifies how many independent pieces of information you have in the profile. When sampling the altitude range of 6 km in steps of 1 km, DFS of three means that on average the vertical resolution is about 2 km (2 km x DFS = 6 km). The width of the averaging kernels provides an estimate of the vertical resolution at each altitude,

It seems that you refer to different definitions of the information content (DFS, Shannon's information content) in your paper, but numerically use only DFS. You should clearly indicate in the paper which information content definition you refer to whenever you mention "information content".

We apologize for the confusion in our manuscript. The information content used in our analysis is the degrees of freedom for signal defined as the diagonal elements of the averaging kernel matrix A. A different approach would be to use the Shannon Information Content (H; Shannon 1948), which is a measure of how the entropy of the system changes when the observations are included. H is defined as

$$H = -\frac{1}{2} ln \left(\frac{S_x}{S_a} \right)$$

This measure of information content is somewhat similar to our Equation 7, which is

$$A = I - \frac{S_x}{S_a}$$

We have updated the manuscript to indicate that there are other measures of information content, and that we are using the DFS approach (which we then explicitly indicate will be discussed in Section 3).

The editor also made a couple of comments that we have addressed. We have updated our references to use the proper formatting, and have removed the reference to the paper that was submitted.