Dear Editor,

At the request of the editor and the reviewer, the following corrections have been made:

- *line 561: retrieved --> retrieve*

- *line 576: "in isotopes abundance" --> "in the abundance of isotopes"*

- *line 614: reference seems to be incomplete*

*Line 481: I think the authors intended to say, 'the atmosphere near the lake shows near-surface stability over 200 to 300 m which deteriorates/mixes away in the afternoon according to the potential temperature profiles.' The rest of the paragraph contradicts the existing first sentence.*

*Fig D2: please add 'ground (black) and flight (grey)' in the legend.*

Hoping to enlighten the reviewer on his next remark:

*In Fig 8, I would be interested to learn how the authors interpret the ASR vertical profiles in the context of the atmospheric stability and mixing. It seems to have to more or different structure compared to the other variables.*

Lidar measurement generally show many more vertical structures and have a higher vertical resolution. They are also more localized in time. What is most important to compare with in situ measurements are the major slope changes. By averaging the in-situ data, rapid variabilities are dampened. A good example is given in Fig. 9c. There is a change in abundance of δD around 2 km a.m.s.l. This change is associated with a slight difference in the vertical gradient of potential temperature and is much more pronounced in the specific humidity. On the ASR (lidar) side, the change in vertical gradient is associated with a maximum that reflects the transition between the valley air and that influenced by the larger scale circulation above. As for the top of the atmospheric boundary layer, a stronger backscatter is observed, mainly associated with the increase in relative humidity which leads to the growing of aerosols. ASR is therefore a good tracer for the identification of vertical structures. On the other hand, it does not provide information on vertical thermal stability, which is more accurately traced by the potential temperature. Obviously, experience in using this type of measurements allows one to know if the layer is more or less stable. Generally speaking, the more the transition is peaked on the ASR, the more we are dealing with a convective layer. For example, there is less convection in Fig. 8a than in Fig. 8b, and this varies in the same way as the vertical stability. Nevertheless, we can have very convective and stable layers. For this reason, it is preferable to use different independent variables to conclude, the ASR being one of them.