First of all, we are very grateful to Referee#2 for his careful reading of manuscript and numerous useful suggestions. Below, we respond his comments:

"Abstract: would be nice to mention the wavelengths 395.4 nm (CH4) and the reference channel (N2, 387 nm) already in the abstract."

Done

"P2, L36: Ansmann 1998, I did not find:":

Corrected

"P3, L77: One should mention, ...somewhere in the introduction...., the MERLIN project (ESA's mission on spaceborne methane lidar observations, with DIAL, but column integrated) to corroborate how important methane observations are. ESA has nice handbooks with nice introductories. One could then mention that such CH4 Raman lidar observations in Lille could be used for ground truth activities. The launch of MERLIN is planned for 2024."

We have added information about MERLIN mission on page 3.

"P6, L175-176: Please do some HYSPLIT computations, provide information about the source region of the detected layers."

Air masses in the layers were transported over the Atlantic from Canada. We have added information obtained from HYSPLIT in discussion of observed methane profiles

"P7, L185-188: Again provide some information about the origin of the air masses detected."

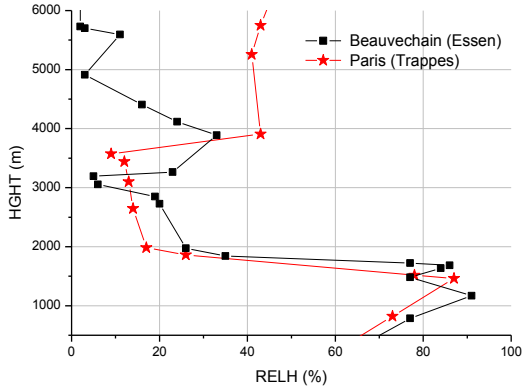
Added

"P7. L195: Note that the apparent lidar ratio in water clouds should be 10-15sr (instead of 18.2sr) because of multiple scattering effects."

Yes, it is correct. We changed for "below 20 sr".

"P8, L217-218: Again, information on the origin of the found air masses would be helpful. Enhanced depolarization can be caused by dust and by dry smoke. Are radiosonde RH profiles available. Smoke may become nonsphercial when RH is below 30%."
"*Fig 5: Are RH profiles available (radiosonde)? Is the lofted layer dry :then nonspherical particles) or wet (more spherical particles)? Further point: Origin of the lofted layer...?"*

We had radiosonde data from Trappes (48.77_N, 1.99_E, Paris, France) and Beauvechain (50.78_N, 4.76_E, Essen, Belgium), corresponding plot on 14 June at 00:00 is attached.



Paris data show RH to be approximately 40% above 4000 m, Essen measurements provide values below 30% at 4000 m. So yes, humidity is not high and smoke, in principle, can depolarize radiation strongly. Unfortunately extinction coefficient of the elevated layer is quite low (below 0.02 km-1), so we are not able to provide reliable lidar ratio in this layer to identify the aerosol type. It can be smoke or smoke mixed with dust as well.

"P10: At the end, mention again the MERLIN mission, and that ground-based Raman lidars are good for ground truth activities."

Added

"Figs. 3 and 4: There are layers, and the reader wants to know: what is the source?"

Back trajectories for both layers are similar: aerosol from Canada is transported over the Atlantic. Unfortunately, basing on HYSPLIT model we are not able to make conclusion about difference in nature of these two close layers.

"Fig 4. Why not a temporal order: b,c,d,e,f,a?"

In revised manuscript we have rearranged plots in temporal order

"Fig. 6: Depolarization ratios of 15-18%! Is that caused by dust or by dry smoke particles? origin of the aerosol ...."

Unfortunately we don't have enough information for ultimate conclusion. Still, usually smoke in lower troposphere doesn't present such high depolarization at 532 nm. So long transported dust mixed with smoke looks more probable.

"Fig. 7: Maybe the smoke was picked up in North America?"

Yes, it is possible. However depolarization at 532 nm is high, this is why we think, that Asian origin of the particles is more probable.