We thank the reviewer for their feedback! We reply to the comments below (in blue color). Line numbers refer to the original submission.

This paper effectively elucidates the Rayleigh-Mie-Raman (RMR) lidar system deployed at the Leibniz Institute of Atmospheric Physics in Germany. It underscores the significance of lidar measurements in the middle atmosphere and emphasizes the global rarity of such facilities due to their intricate nature. The author provides a comprehensive breakdown of the RMR lidar system, offering a lucid overview of each component and their interconnections.

While the individual components may not introduce entirely novel technologies, the paper stands out in its emphasis on explaining the rationale behind their integration into the lidar system. This aspect proves valuable for both seasoned researchers and newcomers seeking a deeper understanding of the system's operational principles.

We are pleased that the reviewer agrees to our concept of extensively describing details of our complex lidar. We hope that this encourages others to develop similar systems.

However, the paper could enhance its impact by delving into the observational implications of these changes. Discussing how the modifications to the RMR lidar system contribute to improved observational capabilities, address specific scientific questions, or advance our understanding of atmospheric phenomena would add a valuable layer to the paper's narrative. Highlighting the potential observational impact would provide readers with a clearer sense of the practical implications and significance of the described changes.

We thank the reviewer for this comment. We will extend the description of science questions and discuss the reasoning behind scientific as well as technical questions. The following sentence will be added in the Introduction: *Most observational studies on gravity waves in the middle atmosphere below 80 km are limited to temperature variations, i.e., they describe only the potential energy of the gravity waves. Waves' kinetic energy is of at least similar significance (e.g., Geller and Gong, 2010), but remains inaccessible to most instruments. Without knowledge of the background wind, only observed, Doppler-shifted wavelengths and periods of the waves can be retrieved, but neither intrinsic periods nor vertical propagation directions can be accurately determined (Reichert et al., 2019; Strelnikova et al., 2020). Wind data from meteorological analyses introduce an unknown error into the derivation of intrinsic wave parameters, especially in the upper stratosphere and mesosphere and in highly dynamic regions like the winter polar vortex.*

In line 393 we will add the following discussion: *Even mean wind speeds above 50 km altitude in ECMWF data often deviate from the observed wind speed by 50% or more, having implications, e.g., for correct estimates of wave filtering processes. […] Overall, this demonstrates the need for wind observations in the mesosphere for the understanding of middle atmosphere dynamics.*

And behind line 401: *This event is not at all captured in the ECMWF-IFS wind and temperature data for our site. We expect better agreement between ECMWF output and observations in summer, when the variability in the middle atmosphere is much* *smaller. Nevertheless, this typical winter example demonstrates the need for local measurements of winds and temperatures for understanding of the dynamics in the stratosphere and mesosphere. Of course, a single site for wind/temperature observations is not sufficient for the understanding of global dynamics. We hope to foster the installation of more middle-atmosphere wind lidars through this documentation.*

The Summary will be added by this sentence (before the last sentence): *Geophysical studies of upward and downward propagating gravity waves and their intrinsic properties are currently ongoing for selected summer and winter events.*

In Section 2.4 we will explain our choice of the MQTT protocol: *Compared to that, a simple TCPIP socket connection is less versatile and always requires distinct relations between the sender and receiver of the information, which reduces the flexibility during development and operation.* The state machine concept will be justified by: *State machines are one possible concept to formalize the different tasks of the lidar measurement. They allow, again, a modular concept and retain a high degree of flexibility.*

I'd also like to suggest a correction: On line 35, it would be beneficial to check "between 30 and 80 km" and remove "(?)".

The question mark is replaced by the reference “Rüfenacht et al., 2012”.

Additionally, in Figure 10, it would be helpful if the lower limits of the y-axis were provided below 45.

We are not sure about this comment. The data is shown above 35 km, which is about the lower limit of the data because of the bi-static setup described in Sec. 2.2. For lower data we would need to apply an overlap correction, which is planned for future versions of the data reduction.

With these considerations and the suggested correction, I recommend accepting the paper. Overall, it presents a valuable resource for those interested in advanced lidar systems."