

Response to Referee #1

We thank Referee #1 for his/her helpful comments. We carefully addressed all comments and accounted for them in our paper as stated below, where we answer all comments. The original comments of the Referee are cited in *italic* font, our response is put below each comment in standard font.

Discussion paper page 2694, line 9: the measurement of phase and amplitude does not provide the altitude, this is derived using in addition the pod (anyway used to derive the other quantities too) this should be mentioned here no RO experts might be confused here.

We agree and improved the respective sentence as follows: “From the measurement of phase and amplitude of LMO signals, complemented by precise position and velocity data of the LEO satellites, profiles of the thermodynamic variables...”

page 2695, line 16: consider to rephrase the sentence, it is not clear

We rephrased the sentence and also the following ones, so it should be clear now:

“In the Earth’s atmosphere, LIO signals experience refractive influences, which affect the propagation path and the intensity, as well as attenuating influences which directly affect the intensity. Effects in the received intensity are equivalently imprinted in the observed transmission. Important refractive effects are bending of ray paths and defocusing, caused by the (primarily vertical) gradient and curvature structure of the atmospheric refractivity, as well as scintillations caused by turbulence, i.e., by small-scale random fluctuations of the refractivity. Relevant influences that attenuate the intensity directly include trace gas absorption, aerosol extinction, Rayleigh scattering, cloud extinction, and the influence of solar radiation scattered into the receiver and of the atmosphere’s thermal radiation.”

page 2701, line 20: what is the meaning of 2D climatology?

We mean the same type of climatology field that we discussed in more detail in the paragraph before Eq. (3), where we describe the climatology fields for the aerosol extinction coefficient. To further clarify this we now extended the explanation in parentheses as follows: “...two-dimensional climatology (a field with the same latitude and height resolution as used for the extinction coefficient)...”

page 2709, starting line 8: consider to streamline the text till _up to line 25

We streamlined the text; we collapsed the first paragraph into the single sentence: “As explained at the beginning of section 3.3, foreign species absorption is the total absorption from all unwanted (foreign) species affecting a channel.”

Again many thanks to Referee#1 for his/her helpful comments in this review.