

Replies to comments by reviewer 1

Comment: In this work, the authors investigated the color of NLCs, quantitatively, based on Mie scattering process and updated NLC scattering simulation model. The main parameters to examine the scattered spectrum are particle size, ozone absorption and influence of multiple scattering. They found that the effect of ozone absorption was less in color (blueish) than the previously reported.

The process of calculation of the NLC color and presentation in Figure 4, 7, 8 are good for who are not familiar to treat the optical characteristics of NLCs.

My conclusion is that the present work is worth to publish with a minor correction.

Reply: We thank the reviewer for his/her constructive and helpful comments. We tried to answer every comment in an appropriate way.

Comment: Minor comments

Line 91-94, solar zenith angle and viewing angle: The authors did not comment on the refraction effect of the solar view angle. Please note how does it consider in their simulation ?

Reply: In our simulations performed with SCIATRAN, refraction effects are taken into account (as described in L. 55-56). L. 91-94 refer to the definition of the viewing geometry in SCIATRAN (Fig. 2). The aim of Fig. 2 was only to explain the different angles in SCIATRAN, which is why refraction effects are not part of it.

Comment: Lines 163-164 “it can be shown that the light scattered by NLCs in the visible spectral range contains important information on the size of NLC particles”.: The authors mention that measuring the color of NLC they can estimate the size of NLC particles (Figure 8). If this is an important finding in the present work, they can show it in quantitatively (Color as a function of particle size with more detail).

Reply: “The authors mention that measuring the color of NLC they can estimate the size of NLC particles (Figure 8).”: We did not say that. The colour also depends strongly on the OD (see Fig. 4). But it is the case that the particle size influences the colour and thus very large particles can be excluded. For a better understanding of this sentence (L. 163-164), we added additional explanations. It now says: “Furthermore, it can be shown that the light scattered by NLCs in the visible spectral range contains important information on the size of NLC particles. Thus, very large particles can be excluded by the resulting colour.”