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Full title: Technique for comparison of backscatter coefficients derived from in-situ cloud prove measurements with concurrent airborne Lidar
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The authors have provided adequate explanations to most of my comments. However, there are still a couple of unclear descriptions in the current manuscript, which should be improved before publication. The topic presented in this paper is suitable for Atmospheric Measurement Techniques. I recommend Minor Revisions for publication.

Comments

<u>*Backscatter coefficient derivation from ECP data*</u>

1. The authors' response to my first comment on the backscattering coefficient derivation from ECP data went off what was supposed to be. A main focus of the first comment was the definition of the backscattering efficiency. Although I suggested the authors to clearly define the backscatter efficiency in the manuscript in the previous round of review, it has not been specified in the current manuscript. The below definition of the backscattering efficiency is commonly used for remote sensing of ice clouds based on micro pulse lidar observations
$$Q_{back} = \frac{Q_{ext}\omega P_{11}(\pi)}{4\pi}, \qquad \text{(R1)}$$
where Q_{ext} is the extinction efficiency; ω is the single-scattering albedo; and $P_{11}(\pi)$ is the scattering phase function at 180° degree. Substituting Eq (R1) into Q_i in Eq (4) gives exactly the backscattering coefficient under the assumption of the projected-area-equivalent sphere radius in Eq. (4), as the extinction/scattering/absorption/backscattering efficiencies are the quantities relative to the projected area of a particle. Therefore, I agree with the authors' statement that the area-equivalent sphere diameter/radius is typically more acceptable. Also, I would like to argue that the backscattering coefficient should be related to the projected area of a particle (i.e., should be the area-equivalent radius in Eq. 4).

   In addition, 180 in Eq (5) should be 2π due to the radian unit in trigonometric functions. Please improve the corresponding descriptions.

   On the backscattering coefficient derivation from OID data, I read Ray and Anderson (2015) and understand that the lidar ratio is derived by curve fitting of the two-way attenuated backscattering intensity measured from OID. Although the authors' response to the comment were somewhat inconsistent with what the paper described, the corresponding descriptions in the revised manuscript are now all consistent and clear.

2. I am confused with an inconsistent description in the revised manuscript that *"For water spheres, πr^2 is the cross-sectional area (A), while for irregular particles such as ice, A is modeled as the cross-sectional area of a backscatter equivalent sphere."* What is a backscatter equivalent sphere? The quantity *A* must be a geometric cross-sectional area of a particle regardless of their particle shapes, as both liquid and ice cases rely on Eq. (4) in deriving the backscattering coefficients from ECP data. As this is critical, please clarify and improve the inconsistency.

3. Figure 3 caption: "**A refractive index of 1.3263 + 5.6 x 10^{-7}j**" To express the imaginary quantity, *i* should be used instead of *j*.