

## ***Interactive comment on “Assessment of Mixed-Layer Height Estimation from Single-wavelength Ceilometer Profiles” by Travis N. Knepp et al.***

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Received and published: 3 August 2017

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We appreciate the reviewer's comments, suggestions, and taking the time to review the manuscript. We address the comments below.

1. Aerosols are used as a tracer for the vertical structure of the atmospheric boundary layer when evaluating MLH from aerosol backscatter intensities. It should be kept in mind that atmospheric particles need some time to adapt to a changing vertical structure of the atmospheric boundary layer (see, e.g., the lower right

C1

frame in Fig. 1 in Emeis and Schäfer 2006). Therefore, it might be advisable to compare radiosonde results to ceilometer results obtained in the hour after (or even in the two hours after) the radiosonde ascent.

- (a) We agree that time is required for particle distribution to adapt to changing atmospheric thermodynamics. However, these changes will be most noticeable during transition times (e.g. dawn and dusk). The number of data points from our dataset during these transition times is too sparse to generate a statistically meaningful analysis. The bulk of our data were collected outside transition events, when the MLH/ABL is comparatively stable. Therefore we consider the analysis, as presented, to be correct and would implement the reviewer's suggestion for data collected during transition events.
2. Horizontal advection of atmospheric particles can deteriorate the relation between the vertical structure of the boundary layer and the vertical profile of aerosol backscatter intensity.
  - (a) Now addressed.
3. Radiosonde data usually have some sort of a hysteresis. The sensors need some time to adapt to the environmental conditions during the ascent. This could lead to a small bias towards higher MLH.
  - (a) Now addressed
4. A minor point is that the Spanish word “mesa” should be explained to readers not acquainted to the topography of the surroundings of Boulder, Colorado.
  - (a) Mesa is the proper term for a geographic structure. A very brief description was added to the text.

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