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Interactive comment on "Robust processing of airborne laser scans to plant area density profiles" *by* Johan Arnqvist et al.

Anonymous Referee #2

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TArnqvist, Freier, and Dellwik introduce a new 'scaled ratio' method for estimating plant area density from airborne scans and compare it to established methods in two temperate forests. The algorithm performs similarly to established algorithms with some notable improvements. The tone of the critique of existing methods was unacceptable and needs to be changed. Methods are designed to be improved upon, not disparaged. The fundamental challenge with the comparison is that there is no basis for determining if one method is better than another, which can really only be determined using computer simulations unless 'true' PAI can somehow be calculated in a field setting. This doesn't diminish the publishablility of the results, but further emphasizes that the tone of the comparison needs to change and that the benefits of the present approach need to be mediated somewhat.

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P1 L11: ‘never’ is a bold statement. There are a number of passages where the skill of the new model is oversold, which will diminish the impact of the present analysis and leave it less clear where further model improvements should be focused.

P1 L21: really plant area density is being measured here, which is fine, just please be clear about it at the start.

Please provide citations for the statement on page 2 Line 7-8.

P3 L 27 do the authors mean Eq. 4-6?

P4 top line yes, but with enough beams something will go through. Is there a good reference for the notion that first returns is ‘problematic’? (avoid this word, and ‘problem’ if possible, also later in the paragraph; this paragraph is poorly references). The title of section 2.3 is entirely too harsh. These researchers worked hard on these methods and the title diminishes their efforts. “combine the benefits” on p. 4 L. 30 is much better. No method is perfect.

P. 6 L. 5: atmospheric scattering will apply to downward and upward-traveling beams.

P6 L19 typo on ‘therefore’

Figure 2 legend: the bright green text (and figure symbols) is not easy on the eyes.

Figure 2 and 3: histograms would also be interesting to compare.

P. 10 L. 22: without a ‘true’ value it isn’t accurate to say that one method or another is an ‘overestimation’. This could however be determined in a simulation.

p. 15: remove ‘dubious’.

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