

Interactive comment on “Quantifying the missing link between forest albedo and productivity in the boreal zone” by Aarne Hovi et al.

Anonymous Referee #1

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This paper presents an assessment of the impact of forest structure (type of tree & broadleaf v deciduous proportion) on albedo and hence FAPAR as a proxy for productivity. This is an important topic given the link between productivity and climate and the use of remote sensing to estimate albedo across large areas. The paper is very well written, clear and the results are well presented. I have a few queries regarding the methods, particularly sensitivity and generality, but if the authors can address these then the paper is suitable to publish and would be of wide interest.

One general query is the model sensitivity to choice of structural assumptions and parameters. It's not clear to me that there is any real effort made to quantify the sensitivity of the results to the assumptions of crown shape, and crown leaf area density. Tree crowns vary a lot in shape, are heavily clumped, and leaf size, angle and woody material have a big impact on the BRF. It would be good if the authors could quantify the

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impacts of some or all of these assumptions on the results. They use tree classes but how big is within and between class variability? The issue is the FRT parameters are driven by allometrics, but these are likely to be very specific aren't they? Hence my comments about generality below.

Similarly, the authors show the importance of the understory, particularly with view and sun angle. Can they say more about this given that in many areas understory can be very significant and can be correlated in terms of cover with the overstory?

The authors are making a claim for generality based on the number of plots they have and the ranges of cover and density and deciduous v conifer mix they have. However I would question in particular how general the Finnish birch forests are likely to be - how representative of deciduous broadleaf forests? Can the authors justify this aspect better?

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