

## ***Interactive comment on “Quantifying seasonal cornice dynamics using a terrestrial laser scanner in Svalbard, Norway” by Holt Hancock et al.***

**Christine Fey (Referee)**

christine.fey@tiwag.at

Received and published: 20 November 2019

The paper deals with the TLS based analyses of the cornice processes. To my Knowledge, yet there are no other studies on cornice analyses by TLS. Since I am more expert on laser scanning and landslide processes than on snow research I can evaluate the methodological part of the paper in detail. However, the data interpretation and cornice process analyses seem to reasonable, comprehensible and easy to follow. The paper is very well written, structured and clear figures supplement the text. I suggest publishing the paper after minor revisions.

I added some commentaries to the pdf. Here some further suggestion concerning laser scanning:

[Printer-friendly version](#)

[Discussion paper](#)



---

Interactive  
comment

It would be helpful to add the tiepoints used for registration of the scans to the figures. To assess the accuracy only one area is used. The registration error can vary significantly between different areas. Because of this, the mean relative error is not representative for the entire scan. Either the authors enhance the accuracy assessment to more stable areas, which might be difficult in the case that there are now other snow free areas. The other option is, to explain in the text why only one area was used. However, the research question focuses on changes in the magnitude of meters and in this case the accuracy assessment is not so important for the process understanding of cornices. More critical I evaluate the volume estimation of cornices. Here, i) the TLS data uncertainties play a more important role in quantification and ii) it's very challenging to calculate the distance and volume of cornices at scoured areas iii) data gaps are causing significant uncertainties in volume quantification. The problem of data gaps is mentioned and the other points could be enhanced in the discussion. Since the process interpretation in this paper is mainly based on the shape of cornices taken from 2D profiles and distance changes of the snowpack it might be better to study the volume calculation of cornices in detail and publish it in an another research work.

Please also note the supplement to this comment:

<https://www.nat-hazards-earth-syst-sci-discuss.net/nhess-2019-329/nhess-2019-329-RC1-supplement.pdf>

---

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2019-329>, 2019.

[Printer-friendly version](#)

[Discussion paper](#)

