Interactive comment on "The RHOSSA campaign: Multi-resolution monitoring of the seasonal evolution of the structure and mechanical stability of an alpine snowpack" *by* Neige Calonne et al.

Anonymous Referee #2

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The paper presents the RHOSSA campaign focusing on snow density, SSA and stability measurements over one winter in Weissfluhjoch, Switzerland. Modern methods such as SMP and IceCube are compared with traditional snow pit measurements and SNOWPACK modeling. Measurement results demonstrate how modern methods can increase temporal and vertical resolution in snow profiling compared with traditional measurements. This kind of data sets allow proper evaluation of modeling results, which is not possible using traditional measurements due to their poor temporal and vertical resolution. The main result is the recalibration of Proksch et al. 2015 model for deriving SSA and snow density from SMP data.

The snow stability part is a bit disconnected from the main text, which focuses on SSA and density. The authors could consider dropping the stability measurements.

Specific comments:

p4r4 Section 6-> Section 5

p4r12 Degrees missing from coordinates.

p6r15 The snowpack was sampled with 3 cm resolution. What did you do with layers thinner than 3 cm? This explains why the 22 Feb layer is "only diffusely reported in the IceCube data" (p16 r17), if it is mixed with grains from other layers. How did you sample the MF layers? They are very difficult to get into sample holder without breaking them. Were the low density layers compacted to avoid measuring the sample holder?

p8r8 Why exactly 1.2 °C?

p9r10 What is the justification for selecting different method for matching the profiles here than later in the paper (p9r24)? If re-aligning profiles using the MF layer resulted in "better correlation between estimates from SMP and snow pit measurements", why didn't you use the same method here to derive the parameters?

p9 The model parameters are derived from IceCube measurements. Later (e.g. Fig 11) you show that there are big differences between IceCube and tomography measurements. Please comment on the accuracy of SMP-derived SSA values.

p11r2 choose->chose

p11r20 caption->panel

p22 Fig 11. The difference between SSA derived from SMP and tomography varies between different layers. Do you think the snow structure (grain type) has something to do with that? Should the SSA model be calibrated separately for different grain types? And why are there big differences between IceCube measurements and SMP, if IceCube data was used in the fitting, shouldn't they agree better?

p23 Fig 12. Please add SNOWPACK profiles as well.

C3