Wachs and co-authors present a timely study that successfully reconstructs a continuous 6000-year age-depth profile for the rapidly disappearing Weißseespitze (WSS) summit glacier. By combining ^{39}Ar and ^{14}C dating techniques, the authors overcome the significant challenge of unknown surface ages due to recent ablation. Different age models have been used to find the best fit to the observed data. An age-depth profile was constructed. The preliminary comparison of the Ca^{2+} record with Colle Gnifetti further supported the newly constructed chronology at WSS. The paper is clearly written and the work is of great relevance to the fields of glaciology, paleoclimatology, and geochronology. I recommend this manuscript for publication, after some relatively minor revision.

Comments and suggestions:

First, I have some technical questions about the age models and the ^{39}Ar measurements that I would like to discuss with the authors.

1) Sensitivity to the Last Steady State (LSS) Assumption

The model fitting relies on the estimation of the LSS (1914 ± 50 a, 47 ± 10 m). The uncertainty of these values is a significant potential source of error in the age model.

The author stated that the uncertainty of the LSS has been included in the MC simulation. However the data presented in the supplement material only shows the MC simulation in the p-b parameter space. In the 2p model, the ice thickness H and the accumulation rate b are correlated, meaning for a given parameter H_0 and b_0, if one chooses another H_1 and scales b_1 as $b_0(H_1/H_0)^2$ (in the case of p ~1), it will result in a same age scale with a small constant age offset. Based on this estimation, I would expect that the variation of b is at the level of ±40%, which is significantly larger than the values in Table 3. Showing the MC simulation similar to Fig. S3 in the b–H parameter space would clarify this issue.

2) Background estimation in the ^{39}Ar analysis

It is a pity that the authors had to discard many ^{39}Ar data due to various reasons. The causes given in the manuscript are certainly possible. But it just caught my eye that all the ^{39}Ar ages despite two (WSS 24 Surface A and B) are around 400 a (see Fig. 3). Is it possible that this could be due to a residual background of the instrument? I understand that blank measurements were conducted to measure the background before the sample analysis. But were these blank measurements carried out under similar conditions to the sample measurements (i.e. gas pressure, discharge RF power, etc.)? I am asking this because the outgassing rate can be vastly different depending on the operating mode of the discharge. So, one has to make sure all measurements are carried out under similar conditions. Otherwise, the background estimated from the blank measurements may not represent the true background during the sample analysis.

3) Discussion on Constant Accumulation Rate

The 2p model assumes a constant accumulation rate over 6000 years. The authors have pointed out a constant accumulation rate b cannot be expected due to the changing climatic history of the

region. While the split-fit analysis (upper vs. lower samples) is a good check, the difference in values (0.71 vs. 0.46 m w.e. a^{-1}) warrants a more detailed discussion. The authors may consider adding some discussion about what climatic factors could cause such variability in this region and how this might affect the model's interpretation.

Other minor comments:

The best fit in Figure S3 is not located in the center of the red part of the MC simulations, but at the corner of it, which is a little odd to me. Could this be caused by under sampling?

What is the horizontal velocity of the glacier at the drilling position? Are there any measurements based on snow stakes? How does the horizontal movement of the glacier affect the alignment of ice cores drilled in different years?

Line 83, "…the basal layers will soon warm above…",->" …the basal layers will soon be warm above…".

Line 156, Are these counting rates for modern samples or for the sample around 400 years old?

Line 164, In the data analysis, does the rate parameter r change with time or is it set at a certain value based on the average counting rate? Could the author provide a reference containing details about the data analysis process?

Line 217, "as well as" ->"and".