Review comments on tc-2021-235 manuscript, entitled," GNSS signal-based snow water equivalent determination for different snowpack conditions along a steep elevation gradient".

General comments:

The tc-2021-235 manuscript, entitled," GNSS signal-based snow water equivalent determination for different snowpack conditions along a steep elevation gradient" presents the applicability of the GNSS-based SWE measurement at four different locations (820, 1185, 1510 and 2540 m a.s.l.) in the eastern Swiss Alps during two winter seasons (2018-2020). The aim of the study is to assess the performance of the GNSS algorithm which was described by Koch et al. (2019) and validated at the high-alpine site Weissfluhjoch (2540 m a.s.l) in the conditions of shallow snowpack, more frequent changes between dry- and wet-snow conditions.

As general comment, it is not evident that there are new conclusions on GNSS signal-based snow water equivalent determination rather than published ones as it is not clear whether different snow conditions studied newly; performance of the GNSS algorithm at 2540 m a.s.l. known and no much data at 820 m a.s.l. and not clear difference in snow condition at 1185 and 1510 m a.s.l. There was very good work done and analyses and conclusions were driven. Manuscript should be re-organized with a new title.

Specific Comments:

Comment-1: It was said that the performance of the GNSS algorithm was validated at the high-alpine site high-alpine site Weissfluhjoch (2540 m a.s.l) (Koch et al., 2019). And this site was again listed as one of 4 sites to be assessed in this study. This makes a bit confusing. Were the same results used from Koch et., 2019 or new analysis were done and added to this study? This should be explained well, and necessary modifications should be done.

Comment-2: In Line 205: It is said "We have chosen a 12-hour measurement period as it provides the best trade-off between accuracy and latency." It would be good to explain this selection with a bit more justification if possible. As the GNSS algorithm was validated in higher -alpine site where less changes in snow conditions. Were there any data / graphs related frequent changes between dry- and wet snow conditions at four test sites selected? Linking to this, in figure 3, color bar given in time when dry-snow and wet-snow GNSS algorithm were used. How were these algorithms decided to use?

Comment-3: The aim of the study was said to assess the performance of the GNSS algorithm in the conditions of shallow snowpack, more frequent changes between dry- and wet-snow conditions. Looking at the figure 3, and again color bar where dry-snow and wet-snow GNSS algorithm used, it looks to me there were no frequent changes in snow conditions or? It would be necessary to give information on snow conditions at test locations.

Comment-4: In Line 251: it is said that "For Küblis, only a qualitative evaluation was possible as there was hardly any snow during winter 2019-2020 and a long data gap in winter 2018-2019." Küblis 820 m a.s.l. (KUB) is important test location as lowest alpine-site where the conditions of shallow snowpack, more frequent changes between dry- and wet-snow conditions are higher probability as the purpose of the study. The Weissfluhjoch (2540 m a.s.l) site was already validated (Koch et al., 2019).

Comment-5: In Line 589 in Conclusion: It is said that “Overall, our analysis confirmed that the GNSS system can reliably measure the seasonal evolution of SWE at different elevations where different snow conditions prevail. We conclude that the GNSS-based derivation of SWE is a valuable, affordable and reliable alternative to manual measurements or other automated SWE sensors; the method is in principle suited for operational SWE monitoring. Moreover, the GNSS method represents to the best of our knowledge the most appropriate and cost-effective approach for measuring SWE and LWC simultaneously, continuously and non-destructively.”

In this conclusion, what is new? There was already published studies in high-alpine snow conditions and there were no good data in lowest alpine, Küblis 820 m a.s.l. (KUB). Previous studies have also shown that the GNSS-based derivation of SWE is a valuable, affordable and reliable alternative to manual measurements or other automated SWE sensors; the method is in principle suited for operational SWE monitoring and etc.