

## Answers to Comments Referee 2

### General response

*The paper „Prediction of Alpine Foehn from time series of GNSS troposphere products using machine learning” shows first the selection of the ML methods and then usage of two of them on a GNSS tropospheric data set (tropospheric delays and gradients) to detect the foehn occurrences. It is a very new field of study as most of the GNSS meteorology research focuses on the precipitation/humidity parameters rather as foehn. Also the usage of the machine learning algorithms is interesting. I found the paper very well written. The only drawbacks of the paper are: 1. Sometimes a more extended discussion on the results is lacking, 2. The figures (especially Fig.5-10) could be made more interesting.*

We want to thank referee two for the positive feedback on the manuscript and valuable comments how to further improve it. We will provide a more detailed discussion of certain aspects and try to make the plots more interesting (as far as possible). All specific comments are addressed below.

### Specific comments

1. *Title: since you always work on the past data (even with the NRT approach), it is rather a ‘detection’ than a ‘prediction’, so maybe the title could be changed accordingly*

We were already thinking about changing the title (e.g. specifying the location Altdorf in the title) as the original title might be too promising. However, as we introduce the time shift on the FI time series, we actually do a prediction (for the next hour). We might provide some results for both approaches (detection—shift = 0 h and prediction—shift = -1 h) for comparison.

2. *Line 3: ‘lee/luv’ – a specific terminology, maybe worth explaining (at least in the Introduction, however ‘luv’ doesn’t appear anywhere else than the abstract*

Will be introduced

3. *Line 68 ‘COSMO (Consortium for Small-scale Modeling).’ -> ‘Consortium for Small-scale Modeling COSMO’; the full name should go before abbreviation*

Will be changed

4. *Line 90: This is not the exact formula from Rueger and I think there is a mistake there: However, I would recommend sticking to the original formulation as then you have a clear distinction between the dry and water vapor parts.*

Thanks for this hint, we will include the original version in the revised manuscript.

5. *Figure 1: Would be nice to see the topography in this Figure to better visualize foehn*

Will be updated

6. *Section 4.1: I would recommend giving here at least very brief overview of the selected methods*

Will be updated

7. *Line 163: '(negative) maximum' - > why not use 'minimum' here?*

We would interpret 'minimum' as close to zero but one can for sure argue to use minimum here as well.

8. *Fig.3 and Table 2 show exactly the same information, so I would recommend removing one of them, especially that Fig. 3 is not even addressed in the main text.*

This is true, we will remove Figure 3.

9. *Figure 4: Make the foehn line more pronounced*

Will be updated

10. *Line 259: Would be good to comment here what the chosen parameters mean*

Will be updated

11. *Figure 5: Maybe you could add vertical lines so the reader can more easily compare the data for particular dates; also you do not comment this plot in the text*

Will be updated and commented in the text

12. *Figure 6 and 7: Maybe there is a way to plot them together for better comparisons of the two methods?*

We will try to come up with a plot like this, although it is quite challenging to combine the plots while keeping the clarity

13. *Line 284: A more detailed discussion about the features would be advantageous*

Will be given

14. *Figure 9: Why not add here a line also of the match with GB (not only with the adjusted one); also it seems like the event of Oct 2020 was caught by the algorithm but in a different epoch – maybe it is something to look into*

Will be done, thanks for the hint

15. *Line 312: Would be nice to see here more discussion on why you change the threshold and how it is done*

Will be included in the revised manuscript