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Interactive comment on "Meteorological observations in tall masts for mapping of atmospheric flow in Norwegian fjords" *by* Birgitte Rugaard Furevik et al.

Anonymous Referee #2

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This paper presents a dataset of meteorological observations collected in 11 tall masts in three different fjords systems of Mid-Norway. A large part of the manuscript is devoted to the description of each measurements site, which include useful information about fjords geographic features and operating instruments. The last two sections are dedicated to a (too) brief description of quality control procedures and to a presentation of measured wind, temperature and precipitation data.

As general comment, I think that the authors present an interesting dataset, which can be certainly useful for meteorological and engineering purposes. However, I think that this work has some point of weaknesses that must be addressed before considering

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it for publication in ESSD. First, the quality presentation of the study is unsatisfactory for the level of a journal such as ESSD: therefore, the first suggestion is to perform a formal revision of the manuscript, improving language and style.

From a strictly scientific point of view, the paper must be revised according to the following suggestions:

- In my opinion, when presenting the data (Section 4) authors use the word “climate” in an inappropriate way. For example, a period of 18 years (Lines 360) cannot be used to reach any robust conclusions from a strictly climatological perspective. You can speak about climate only when you managed a meteorological time series of at least 30 year. This consideration is obviously and even more so valid for the new dataset presented in this study. For example, at Line 258 you cannot speak about “wind climate”, considering only two or three years of data. I suggest to use “wind regime” and to underline that no climatological results or conclusions can be achieved from the available data. You can present your results only from a meteorological perspective. In other words, the wind regime observed in the 11 sites might be affected by the atmospheric variability and anomalies observed in a specific year and/or season, due to the very limited time period taken into account.

- In section 3, the authors describe the data handling and quality. I suggest extending this section, providing more details about data quality control, which is a critical and focal point of any data description paper. My recommendation is to structure the quality control into at least three different step, considering the following tests: 1. Gross error test, which flag data that are above or below acceptable physical limits; 2. The tolerance test, which detects the outliers, i.e. the values that are above or below some specific limits defined according to a probability distribution model; 3. The temporal coherence test, which identifies unrealistic “jumps” between two consecutive observations according to the change that might be expected for a determined variable in a specific time interval. A graphical example for each of the just mentioned basic quality control step should be provided. Moreover, the authors may also consider to apply a

fourth quality control step, based on spatial consistency among the available measurements. A useful reference may be following paper, recently published on ESSD:

Capozzi, V., Cotroneo, Y., Castagno, P., De Vivo, C., and Budillon, G.: Rescue and quality control of sub-daily meteorological data collected at Montevergine Observatory (Southern Apennines), 1884–1963, Earth Syst. Sci. Data, 12, 1467–1487, https://doi.org/10.5194/essd-12-1467-2020, 2020.

Other useful references:

Hubbard, K., You, J., and Shulski, M.: Toward a Better Quality Control of Weather Data, Practical Concepts of Quality Control, edited by: Saber, M. and Nezhad, F., ISBN: 978-953-51-0887-0, InTech, https://doi.org/10.5772/51632, 2012.âĂĆ

Steinacker, R., Mayer, D., and Steiner, A.: Data Quality Control Based on Self-Consistency, Mon. Weather Rev., 139, 3974–3991, https://doi.org/10.1175/MWR-D-10-05024.1, 2011.âĂĆ

World Meteorological Organization: Guide to Meteorological Instruments and Methods of Observation, 2008 Edition, WMO-no. 8 (Seventh edition), available at: https://www.wmo.int/pages/prog/www/IMOP/publications/CIMO-Guide/OLD-pages/CIMO_Guide-7th_Edition-2008.html (last access: 1 October 2019), 2008.âĂĆ

- About the comparison between reference station and data from masts, I suggest to produce plots based on the same period. I understand that the data availability may be a problem, because it varies from a measurements point to another, but it is necessary to identify a common period allowing performing a real comparison between the wind roses presented in Fig. 11. When discussing this figure, I think that is important to highlight that northeastern winds have a relevant frequency only in Aakvivk A, Gjeveneset A and Rjaaneset A. How do you explain this result? Why in other mast locations the wind regime is so different from the reference one (upper left panel of Fig. 11)?

- In the introduction section (Lines 48-49), the authors claim that the measurement

campaign presented in their work may have interesting and relevant implications for studies concerning the boundary layer variability in complex terrain. I agree with the authors, but I do not understand why the authors did not further stress this point when presenting the data in section 4. Therefore, I suggest showing some examples of vertical profiles of wind speed, wind direction, temperature and relative humidity obtained from the available measurements. For example, the authors may produce a vertical profile for each of three fjords, considering the measurements that are best suited for this purpose. To highlight the good potential of the dataset, the authors may also present, only for illustrative purposes, a comparison between vertical profiles obtained in different meteorological scenarios.

Best regards.

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