Earth Syst. Sci. Data Discuss., referee comment RC2
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Comment on essd-2021-30

Anonymous Referee #2

Referee comment on "A mean-sea-level pressure time series for Trieste, Italy (1841–2018)" by Fabio Raicich and Renato R. Colucci, Earth Syst. Sci. Data Discuss., https://doi.org/10.5194/essd-2021-30-RC2, 2021

The manuscript by Raicich and Colucci describes a long daily pressure record for Trieste. The methods are sound and the authors clearly put a lot of effort into recovering and using relevant metadata, which rises significantly the quality of their work. I also appreciate the extra effort in trying to estimate the uncertainty of the pressure values.

On the other hand, I am disappointed by the fact that sub-daily observations are not provided: many important climate products based on pressure data (above all, reanalyses) can hardly make use of daily means. It is also a matter of scientific transparency, as it is not possible to reproduce the results without the raw observations. Therefore I would recommend the authors to publish the hourly/sub-daily observations as well, unless there is a data policy issue that prevents them to do so.

As the other reviewer also pointed out, it would be a good idea to compare the results with the Trieste pressure series produced by previous efforts. I actually tried to compare a couple of years of monthly data (1861-1862) with the data published on Austrian yearbooks (https://books.google.ch/books?id=cJA_AAAAcAAJ) and there seem to be a 1-month offset (e.g. the data labeled as “1862-01” is actually for December 1861, please check that!). Even with this error corrected, the differences in monthly means range from +2.6 to -3.6 hPa in those two years (note that yearbook data are not reduced to sea level). Can the methodology alone explain these differences? Or is it perhaps a different station? I assume there might be miscalculation and mistranscription components as well: it could be interesting to know if and how much previously (digitally) available series are affected by them.

Specific comments

Page 4, Line 26: how certain are you that time was always GMT+00:55? 1842 seems a bit early (not by much, though) for that kind of standardization, which was brought by railways starting from around the 1850s. If a sun clock was used instead, the difference would be up to around 15 minutes depending on the season, which is probably irrelevant anyway (but would be good to know).

P4, L40: maybe use a semicolon or a period after "drifts".

P5, L13: could you say a few more words about the quality control? What happened to the errors that you could not correct? Would you recommend to perform a finer quality control to the users of your data?

P6, L6: "Each observation site is characterized by a peculiar mean daily cycle". This is an interesting point, could you explain more in detail what the differences are (amplitude, time shits?) and what the causes could be?

P9, Section 3.2: I believe that pressure data from Trieste are assimilated into 20CR starting from 1875, although I am not sure to what extent (see e.g. https://psl.noaa.gov/data/ISPD/). This is relevant for the validation because it means that 20CR might not be independent from your data.
There exists a pressure series from Udine that covers 1803-1855 (https://books.google.ch/books?id=xaxSAAAAcAAJ&pg=PA95&dq=jahrboek+udine&hl=en&sa=X&ved=2ahUKEwiW_p-9n-fvAhVDQhoKHRjvCsIQ6AEwAXoECAIQAg#v=onepage&q=jahrboek%20udine&f=false), perhaps you could try to compare that one too, although the overlapping period is short (but relevant, e.g., for Fig. 6).

Figure 6: I am not 100% sure I understand the problem here: what you label as "not reduced to 0°C" (red line) was probably actually reduced by the observer and then reduced again by you, is that what you are saying? Wouldn't then be better to not reduce those data? Or is that what you did at the end?

P11, L35: Trieste is repeated twice.

P11, L37: I suggest you to rephrase your last sentence in a less negative way, because it gives the impression that daily data before 1880 are not usable, which I do not believe is the case - also considering that you provide an uncertainty estimation attached to the data. To me an error of <2 hPa speaks for rather high quality for early instrumental data.

Appendix A.3: please state whether these corrections were applied by you or directly by

the observer.

Appendix A.4.: please give more details on T’v (data source? is it a climatology?)