



## Comment on cp-2021-33

Anonymous Referee #2

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Referee comment on "Combined analysis of early pressure observation data and historical daily weather documents for winter climate reconstruction in Japan" by Junpei Hirano et al., Clim. Past Discuss., <https://doi.org/10.5194/cp-2021-33-RC2>, 2021

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This paper examined the relationship between East Asian winter monsoon and weather patterns in Japan, and discussed the reliability of climate reconstruction using historical weather documents and early instrumental records. The analysis process is reasonable to me, although certain elaborations and revision are needed. Here are some questions I have while reading this article.

- (1) In Fig.1, nine locations were selected to find out the synoptic weather patterns in Japan. Are they the only locations that have available historical weather records? If not, how are they selected?
- (2) Also in Fig.1, the second location (counted from the north to the south) is considered as location in the Sea of Japan side. However, we can see from the elevation map that it locates in the northeast side of a mountain (or a high-altitude area), which is the leeward side relative to the East Asian winter monsoon. Also, according to Fig.5(d)-(e), it seems that there is limited precipitation in this location during WMDs. So, is it appropriate to classify it as the Sea of Japan side?
- (3) According to line 182-183, the format of weather description in JMA data changed significantly after the mid-1980s, which makes it not appropriate for identification of synoptic weather patterns. Could you give an example in the text?
- (4) In line 220, the continuous WMD days are not selected in the composited analysis (except the first WMD). But it's not quite clear to me that are there WMDs in the "preceding four days"? For example, suppose the WMD series from day 1 to day 5 is "WMD1-normal-WMD2-normal-WMD3", are WMD2 and WMD3 adopted in the composite analysis, or only series like "normal-normal-normal-normal-WMD" adopted?
- (5) In section 4.2, a case study is conducted for the winter of 1973/74. Why is this year selected? This seems a bit abrupt.
- (6) Similar to the last question, the historical case is for the winter of 1851/52. I think that the argument would be much more reliable if the study period is longer than one year. If the digitization of the surface pressure observation requires large amount of work, it is feasible to use the data of just Tokyo and Nagasaki, since this study already shows

that SLP N-T is as effective as SLP B-T capturing the activity of the East Asian winter monsoon.

(7) In Fig.7(b) and (c), the bold purple line did not appear in the legend (also in Fig.8).