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Atmospheric Measurement Techniques Discussions

Interactive comment on "Smartphone Pressure Data: Quality Control and Impact on Atmospheric Analysis" *by* Rumeng Li et al.

Anonymous Referee #3

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Review of AMT-2020-190 "Smartphone Pressure Data: Quality Control and Impact on Atmospheric Analysis" By: Rumeng Li, Qinghong Zhang, Juanzhen Sun, Yun Chen,Lili Ding5, and Tian Wang

The manuscript presents an analysis of the global spatial and temporal variation of smartphone pressure measurements using data collected in China by a Weather App every second, in 2016. The Authors present a new bias correction method based on a machine learning approach, showing the potential for the use of this type of dataset in conjunction with surface meteorological-station measurement. The dataset is used to investigate meteorological information during a hailstorm that occurred in Beijing. The most valuable part of this methodology is in the eye of this Referee the fact that the process does not require users' personal information, so avoiding a lot of pushback

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for privacy-protection. I think the manuscript is well written, the methodology is clearly presented, and it is a good read. Figures are mostly clear; some suggestions about those are below. The study is well suited for AMT and it will be a good contribution to make better use of this type of information.

Major comments:

Figures: I don't understand the use of numeration A1, A2,... for the figures, since they are just used normally in the text and those identified by the "A" are not part of an Appendix. Would it make sense to just add them to the list of regular figures in the manuscript? In this case Figures have to be renumbered sequentially, as mentioned in the text, and text has to be changed accordingly.

Minor comments:

Page 2, line 57: While in this study you make use of the Moji Weather App, do you envision the same good outcome from other Weather Apps?

Page 4, line 119: Is the threshold of 15 hPa found empirically?

Fig. 2a: Labels "SH" and "TJ" should be a different color (maybe black?) as the one used now makes them not visible. Also, the white circles are not very visible now.

Page 6, lines 159, 160, and 174: Replace "(Fig. 2a.)" with "(Fig. 2a)". Replace "(Fig. 2b.)" with "(Fig. 2b)". Replace "(Fig. A3b.)" with "(Fig. A3b)"

Section 3.2 and Fig. 3: Why do you think in December data count is so low compared to the other months?

Fig 4: Again, the labels "TJ" and "BJ" are not very visible with the chosen color.

Page 7, line 190: Replace "Fig. 5a., b" with "Fig. 5a, b". Similar corrections should be applied in other places in the text (i.e.: Page 8 lines 234, 235; Page 9, line 260; Page 9, line 272...).

Page 7, line 195: Do you mean SMO is not shown in Fig. 6 for subdomain 7 and 8? MP is shown. Also, I would still plot green bars for SMO going to the top of the graphic, for subdomain 7 and 8 (still mentioning in the text that these 2 bars are more than 9 hours long). It would be good to visually see how longer is the computation time for this method.

Page 7, line 212: "(Fig. 7b., d)." change to "(Fig. 7b, d)."

Page 8, line 232: Where does the threshold 0.52 mb come from?

Page 10, line 292: Replace "that we received; and the bias" with "that we received, and the bias"

Fig. 12: To highlight the stations with MAE differences between SFC and SP being significant with 90% confidence try to use underline AND bold.

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