

## ***Interactive comment on “The climatology of planetary boundary layer height in China derived from radiosonde and reanalysis data” by Jianping Guo et al.***

### **Anonymous Referee #1**

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The manuscript reports climatology of planetary boundary layer (PBL) height in China from sounding observations and a reanalysis data, and explores the relationship between PBL height and meteorological factors such as surface pressure, wind speed, atmospheric instability, etc. As this study represents the first effort to compile the historical records of sounding-based PBL climatology in China, the results in this paper and future exploration of the data are crucial for understanding the regional climate changes in East Asia. I recommend accepting the manuscript by ACP after the authors address some minor comments below.

1) Can the authors provide the related equations that estimate BLH using the bulk Ri method?

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2) Page 9, line 15-20. The authors stated that PBL height is higher in spring than that in summer and they attributed it to the stronger near-surface wind spring. To me, such a seasonal difference of PBL is only obvious at 2000 BJT, not for 0800 BJT, according to Fig. 5. So my question is if the wind only differs at 2000 BJT between spring and summer? An additional plot may help to elucidate it.

3) Fig. 7. Tibet Plateau shows the highest PBL height in winter. Why?

4) Fig. 13. How about the correlations based on monthly mean data for each month other than the annual cycles? Meanwhile, the plot needs to be stretched vertically.

5) The interference between PBL height and atmospheric aerosol concentrations were widely discusses by previous studies [Y. Wang et al., Atmos. Env., 2013; R. Zhang et al., Chem. Rev., 2015], especially over China [A. Ding et al., GRL, 2016]. Those discussions are worthy in the introduction part to emphasize the importance of the PBL record in the air pollution research.

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