

Interactive comment on “Influence of the Bermuda High on interannual variability of summertime ozone in the Houston-Galveston-Brazoria region” by Yuxuan Wang et al.

Anonymous Referee #2

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This manuscript examines whether interannual variability in summertime monthly ozone concentrations in Houston can be explained by the strength and location of the Bermuda High. Through multiple linear regression analysis, the authors show that a remarkable degree of ozone variability can be explained by the intensity and longitudinal extent of the Bermuda High. These features of the large scale circulation patterns can explain even more of the interannual variability than local temperatures or winds. It is useful that the authors briefly touch on the influence of BH metrics on ozone in other Gulf Coast cities, to show the extent to which the conclusions for Houston might apply elsewhere.

The methods of the paper are sound and its findings are well explained. The

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manuscript merits publication in ACP after addressing the minor comments noted below.

1. The paper focuses on June, July and August, noting in Lines 100-101 that this is when the Bermuda High is closer to North America and more influential on circulation patterns over Houston. However, as shown in Figure 5, Houston ozone exhibits a bimodal seasonality, with some of the highest ozone and exceedance rates occurring in the spring and early fall rather than in JJA. If the meteorological features identified here are unable to predict peak ozone outside of JJA, this should be noted as a limitation of the study.
2. The ozone standard is now 70 ppb, though the paper uses the earlier 75 ppb standard as the exceedance threshold.
3. It should be clarified in Lines 92-93 how the Bermuda High influences nocturnal low level jets.
4. Meteorological data is taken from a 2.5 x 2.5 degree reanalysis, but the longitude of the Bermuda High is reported with 0.1 degree precision. Clarify how BH-Lon was computed from the data.
5. Line 159: Clarify what is meant by the 850hPa wind ridgeline.
6. The authors choose to de-trend the Bermuda High longitude data, though the reasons behind the trend remain unclear (lines 176-184). It would be helpful to note how the results would have been affected if BH-Lon had not been de-trended.
7. It is unclear how Figure 6a illustrates the claim in lines 247-249.
8. Where was the correlation observed in Zhu and Liang (lines 312-314)
9. In Figure 3, I don't see the black dashed line, and the units of the "5" arrow should be clarified.

Minor technical corrections: Line 63: replace "the high pressures" with "high pressure";

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Line 160: replace "the US" with "Houston"; Line 343: replace "the former month" with "2001" for clarity.

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