

Ann. Geophys. Discuss., author comment AC4  
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## Reply on RC3

Igo Paulino et al.

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Author comment on "Influence of the semidiurnal lunar tide in the equatorial plasma bubble zonal drifts over Brazil" by Igo Paulino et al., Ann. Geophys. Discuss.,  
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**REVIEWER: ``The authors adopted all-sky airglow imager to investigate the zonal drift of EPB and find interesting semidiurnal lunar tide (M2) signatures. The manuscript appears to be a short research letter that only the observational results are provided with inadequate interpretations and discussions.''**

AUTHORS: We thank the reviewer for the comments and suggestions.

**REVIEWER: ``The authors? discussion on the solar cycle effects is extremely inadequate, a simple ?must be further investigated? is not an excuse. At least, the author needs to explain why the question cannot be solved in this study? What kind of data might need to resolve the question?''**

AUTHORS: We agree with the reviewer that we have not used the best words in this statement, we have revised it. We are sure of the present results and it is not necessary any further data to conclude on the solar dependence of the  $M_2$  in the EPB zonal drifts. What needs to be further studied is the coupling mechanism that is quite complex and it is maybe the ``biggest puzzle" for the atmospheric sciences (words from Tsunoda, 2006)

**REVIEWER: ``Lines 4-5: Confused with ?the M2 contributes 5.6\% to the variability of the EPB zonal drifts?. How the contribution level is determined?''**

AUTHORS: It represents 5.6% of the average EPB zonal drifts. We have clarified it in the manuscript.

**REVIEWER: ``Line 33: Be specific about ?nighttime? and ?evening?. Lines 36: Two ?as?.''**

AUTHORS: Thank you for the suggestions, we have corrected them.

**REVIEWER: ``Line 93: What is the meaning of ?combination?? Two independent aspects or the combined two effects?'**

AUTHORS:  $M_2$  in the ionosphere responds as the geomagnetic and ionospheric tides. From our point of view, the statement is correct. However, based on the comment of the Reviewer #2, we have improved the discussion on this topic.

**REVIEWER: ``Line 106: Rewrite ?Additionally, they showed that the M2 is larger in this region as compared to the geomagnetic contribution from the space perturbations?. Lines 105-107: Two ?Additionally?. Lines 119-120: Rewrite ?as in the temperature (Paulino et al., 2013) as in the zonal wind?. Lines 128-134: Rewrite ?Forbes??. And summary the main idea of this paragraph."**

AUTHORS: Thank you for the suggestions, we have fixed them.

**REVIEWER: ``Lines 128-129: What do mean ?differences near the equator?'"**

AUTHORS: We have fixed this statement for a better understanding. Thank you for asking.

## **REFERENCES**

Tsunoda, R. T. (2006), Day-to-day variability in equatorial spread  $F$ : Is there some physics missing? *Geophys. Res. Lett.*, 33, L16106, doi:10.1029/2006GL025956.