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Variability of the lunar semidiurnal tidal amplitudes in the ionosphere over Brazil

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The variability in the amplitudes of the lunar semidiurnal tide is investigated using TEC maps over Brazil from January 2011 to December 2014. The authors find evidence of strong annual variation. Semiannual and intra-seasonal oscillations are found to be the second and third largest components, respectively. Among the short-period oscillations in the amplitude of the lunar tide, the most pronounced ones were concentrated between 7-11 days, which the authors ascribe to the normal mode westward propagating quasi 10 days planetary wave with horizontal wavenumber equal to 1. The presented results suggest a possible coupling process by modulation of the lunar semidiurnal tidal amplitudes that allows the propagation of the 7-11 days waves into the thermosphere-ionosphere system.

General comment

While the manuscript contains some interesting results, I cannot recommend publication in the present form for the following two reasons:

- (1) The language should be improved.
- (2) Additional observational and/or modeling work is needed to demonstrate that the ~9-day oscillation is indeed consistent with a westward quasi-10-day normal mode.

Other comments and technical corrections

- Line 4 (and throughout): Intra-seasonal variability is usually referred to variations less than ~90 days.
- Line 6: in special → in particular
- Lines 9-10 (see comment before): This sentence and result is highly speculative. More modeling or observational work should be done to demonstrate a link to the 10-day normal mode.
- Lines 19-20: need reference
- Line 22: Ozone → ozone
- Lines 26-27: these ranges are not consistent with other studies. Need reference.
- Lines 48-49: define what is meant with long and short period
- Section 2: More details on how the lunar tide is calculated are needed.
- Line 60: reference for the filter needed
- Line 77-78 and Figure 3: need to discuss the 70- to 80-day variations and 120 variations
- Wavelet plots: need to include a confidence level
- Line 91: 30 days or 25 days as reported in the legend of Figure 4?
- Line 131: maiximuma → maxima
- Lines 133-134: the oscillation at 70-80 days is almost at large. Need to comment on this.

- Lines 144-148: this statement is highly speculative. Need additional modeling work or analysis of concurrent observations at different longitudinal locations.
- Line 161: thermosphere misspelled
- Line 171: to notice → to note
- Lines 192-194: can the observed intra-seasonal variability be related to Madden-Julian Oscillation?
- Lines 197-198: need to further elaborate this point.
- Line 201: preset → present
- Line 208: though → through
- Lines 209-210: analysis insufficient to support this statement