

## ***Interactive comment on “Variation in total electron content with sunspot number during the ascending and maximum phases of solar cycle 24 at Birnin Kebbi” by Aghogho Ogwala et al.***

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We have read through the comments raised by anonymous referee. His detailed comments showed that he read through our work line by line and we must commend his effort at improving the quality of our paper. We therefore respond to his comment as follows: 1. All authors have agreed to include more numeric and statistical data in our work and compare with more models of other researchers. Comparison with already established models like IRI-2016 might be included in the present study. We are also familiar with literatures in which only observation data were used and published in reputable journals. 2. Anonymous referee acknowledged new findings in our work.

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We have agreed to further strengthen the explanation using the pre- and post-midnight differences. The corresponding positioning errors of the annual TEC will be included after which the title of the paper might be adjusted. 3. All results will be sufficiently investigated during the review. Issues were raised in some part of introduction (lines 10-19; 56 – 105 and 266 - 277). We think they are all important to mention, for example (line 56 – 105) explains the instrument and method of measuring TEC as an ionospheric parameter and the instrument for measuring other ionospheric parameters. Lines 266 – 277 explains the effect of solar flares and their components resulting from high solar activity to national infrastructure. 4. Anonymous referee might have a misconception of equation 3. This equation is widely documented e.g. Global Positioning System total electron content analysis application user’s manual, 2009, Institute for Scientific Research, Boston College; and doi: 10.1029/2011RS004812 and other. We might consider other approach to equations 3 & 4, for example using the JPL extended slab model (ESM) mapping function to convert STEC to VTEC. Different approach are documented. 5. Values of sunspot number used in our research was obtained before the SPIDR website became unavailable. Therefore, we think it is right to mention and acknowledge it. 6. We have agreed to include all estimated magnitude of day-to-day variation of TEC to strengthen the discussion section. 7. The numerical values and their statistical significance will be explained and compared with those of other authors. 8. Omitting the ionospheric height in equation 4 was an oversight. Ionospheric height will be defined

All other minor errors mentioned by the referee have been noted, they will be corrected during review.

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