

## ***Interactive comment on “Decrease of total electron content during the 9 March 2016 total solar eclipse observed at low latitude stations, Indonesia” by Wahyu Srigutomo et al.***

### **Anonymous Referee #2**

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Manuscript: Decrease of total electron content. . . . .Indonesia By Srigutomo et al.

The work reports the decrease in VTEC over the Indonesian sector during the total solar eclipse on 09 March, 2016 based on data from 40 GPS stations distributed throughout the archipelago. The authors note that 1. VTEC recovery takes more time than the reduction during the eclipse and 2. The maximum reduction in VTEC is more as one goes closer to the path of totality. Is the inference 1 not known based on the work of one of the coauthor's earlier work (Muslims et al., 2016)? Although the authors acknowledge the possible contribution of plasma fountain process during the eclipse period, its role is not critically evaluated in the reduction of VTEC. The work has many

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loose ends and the conclusions are not supported by necessary evidences.

A few specific comments are as follows.

1. Considering the occurrence of moderate storm on 06 March 2016, how do the authors rule out the contribution of negative ionospheric storm during the eclipse period?
2. Reduction in VTEC can also occur through plasma fountain effect essentially driven by the zonal electric field. How do the authors know that there is no electric field disturbance due to disturbance dynamo which can reduce VTEC over the archipelago through fountain effect?
3. How do the authors rule out prompt penetration and associated overshielding effects? It is known that overshielding process can generate westward electric field perturbations during daytime that can reduce VTEC over low latitudes through fountain effect.
4. The elevation angle cut-off of 10 degree will allow multi-path errors in the VTEC estimations. Elevation cut-off of at least 30 degree must be applied.
5. Figure 2: The reductions and increases in VTEC are not conspicuous. Quantitative descriptions are needed in the text.
6. Changes in S4 are negligible during the eclipse period. However, why the authors expect changes in S4 during local morning hours due to eclipse?
7. What do the authors mean when they state that the solar eclipse magnitude is greater than 1?
8. Is this work another repetition/extension of essentially the same work described in the Muslims et al. (2016) work? The same event is addressed in the Muslims et al. (2016) work which is evident from the title.
9. The authors need to put 1-sigma value to the average VTEC variation. If the decrease on 09 March, 2016 is within 1-sigma, then the authors cannot unambiguously attribute the reduction in VTEC to any physical process.
10. Please also note that the satellite and receiver biases together can account for the magnitude of reduction in VTEC during the eclipse (~05 TECU). How do the authors remove these biases?

I am afraid that I am not able to accept this manuscript for publication in Annales Geophysicae.

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