

Interactive comment on “Global sounding of F region irregularities by COSMIC during a geomagnetic storm” by Klemens Hocke et al.

Anonymous Referee #2

Received and published: 13 January 2019

This paper describes the use of COSMIC-GPS observation data (radio occultation grazing/oblique/tangential TEC profiles and Abel-inverted electron density profiles) to monitor the distribution of ionospheric plasma density irregularities around the globe during a geomagnetic storm event on 15 July 2012. High-pass filtered radio occultation TEC and Abel-inverted electron density profiles were used to construct ΔTEC and ΔN_e parameters, which are akin to the RMS values of the fluctuations. The authors further elaborate that either arithmetic mean or median function can be used for calculating the ΔTEC and ΔN_e parameters, depending on the specific situation. It is indicated that ΔTEC is preferred since it involves fewer assumptions (ΔN_e involves uncertain assumptions about spherical symmetry), which I very much agree.

The signal processing/filtering technique and the use of ΔTEC (or ΔN_e) parameters

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are clearly useful for monitoring the distribution of ionospheric plasma density irregularities based on the COSMIC-GPS RO measurements. The paper seems to cover all the bases. However, in the present form, the paper appears to be lacking one single unifying emphasis/spearhead that would serve as a strong focal point. Based on my reading of the manuscript, it was not so clear if the desired emphasis of the paper is:

- a demonstration of the usefulness of the dataset and the analysis technique (?), or
- a highlight of the geophysical phenomena consequential to the storm event (?), or
- a broad overview of the expected geospatial distribution of ionospheric irregularities under various condition (?)

I would suggest that the authors emphasize one particular aspect as a focal point, and the discussion of other aspects may revolve around it. I hope this re-organization of abstract/conclusion sections would not be too much to ask.

Furthermore, I would also like to suggest that extra labels are added to some of the figures in order to improve clarity.

Figure 3a: add a label "Arithmetic Mean" on the top of the colormap plot

Figure 3b: add a label "Median Function" on the top of the colormap plot

Figure 4a: add a label "Solar Minimum" on the top of the colormap plot

Figure 4b: add a label "Solar Maximum" on the top of the colormap plot

Figure 6a: add a label "Quiet Geomagnetic Condition, h=400-500 km" on the top of the colormap plot

Figure 6b: add a label "Geomagnetic Storm Condition, h=400-500 km" on the top of the colormap plot

Figure 7a: add a label "Quiet Geomagnetic Condition, h=200-300 km" on the top of the colormap plot

Figure 7b: add a label "Geomagnetic Storm Condition, h=200-300 km" on the top of the colormap plot

I realize that the figure captions listed these information, but including them as labels

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in the figure images themselves could potentially be helpful to many readers.

Interactive comment on Ann. Geophys. Discuss., <https://doi.org/10.5194/angeo-2018-117>, 2018.