

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

Anonymous Referee #2

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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 Δ TEC 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 Δ TEC and ΔN_e parameters, depending on the specific situation. It is indicated that Δ TEC 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 Δ TEC (or ΔN_e) parameters

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

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

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

Interactive
comment

