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Interactive comment on "Investigation of Effects of Coronal Mass Ejections on Ionospheric Total Electron Content over Nsukka, South Eastern Nigeria" *by* Esther A. Hanson et al.

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RESPONSES TO QUERIES FROM ANONYMOUS REFEREE #1

Yes, when CME is directed towards the Earth as an interplanetary CME, the shock wave of the traveling mass hits the magnetopause and causes a geomagnetic storm which may result in disruption of the magnetosphere; where the magnetosphere is compressed on the day-side and extended on the night-side magnetic tail. Since all these are well known theories, we decided not to bother the reviewer with all these details. However, we can include it. 1.The selection criteria for CMEs were; (i) high speed CMEs, (ii) earth-directed CMEs which

were proven to have caused geomagnetic storms. For instance, Fig. 10 showed an increase in TEC on March 9, 2012. As a validation of our data selection, NASA reported an auroral event and geomagnetic storm occurrence on March 8, 2012 (see https://www.nasa.gov/mission_pages/sunearth/news/News030712-X5-4.html. Earlier, EarthSky reported an X5-class solar flare events occurred on March 6-7, 2017 (See https://earthsky.org/space/another-major-solar-flare-during-night-of-march-6-7-2012 2. The diurnal variation in this study showed the contribution of energy transfer resulting from CMEs. Hence, marked contrasts are observed between TEC signatures at quietest days and those on the selected disturbed days which were day associated with CMEs and geomagnetic storms. 3. I had missing data for Fig. 10 and Fig. 11. I will discard Fig. 11. Some information could still be drawn from Fig. 10 since the data scaled beyond the peak values of TEC at both disturbed and quiet conditions. Nonetheless, I can discard it.

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Please also note the supplement to this comment:
https://www.ann-geophys-discuss.net/angeo-2019-39/angeo-2019-39-AC1-supplement.pdf

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