

Ann. Geophys. Discuss., referee comment RC1  
<https://doi.org/10.5194/angeo-2022-13-RC1>, 2022  
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## Comment on **angeo-2022-13**

Anonymous Referee #1

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Referee comment on "Signature of gravity wave propagations from the Troposphere to Ionosphere" by Hisao Takahashi et al., Ann. Geophys. Discuss.,  
<https://doi.org/10.5194/angeo-2022-13-RC1>, 2022

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Comments: This is interesting study which brings some new information but which requires some improvements before being published.

Concentric waves in dTEC are secondary GWs as I would expect. TEC is integral parameter; nevertheless the secondary GWs could hardly produce quite different wavy oscillations in TEC and in OI 630 nm emission from heights relatively close to the F-region maximum. Therefore possibility that the effect in OI 630 nm, which is essentially the same as the effect of primary waves in OH emission in the mesopause region, is caused by primary GWs unable to propagate well above the OI 630 nm height and affect TEC, seems to me to be probable.

Section 2, Observations: I recommend add the analyzed period.

Line 173: the directions of propagation of GWs in OH and 630 nm emissions are relatively large, they cannot be considered to be almost same.

Wording and misprints:

- Line 44: "et al," should be "et al."
- Line 50: "et al.," should be "et al."
- Line 57: "generating" should be "generates"
- Line 61: "reach the mesosphere to the lower thermosphere". What do you mean, from troposphere to MLT or from mesosphere to the lower thermosphere (I expect the former).
- Line 84: "one TEC" should be "one TECU"; similar corrections throughout the paper.
- Line 98: "an red" should be "a red"
- Line 126: "could not observe" should be "could be observed"
- Line 160: "region was" should be "region; it was"