

Interactive comment on “Ionospheric total electron content anomaly possibly associated with the April 4, 2010 Mw7.2 Mexico earthquake” by Jing Liu et al.

Anonymous Referee #1

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The paper of Liu et al. creates very strange impression starting from the item selected and finishing by used methodology of data processing. So, let's start from the very beginning. 1. Why in year 2020 was selected earthquake which took place 10 years ago and which was studied by other scientists: Mustafa Ulukavak & Mualla Yalcinkaya (2017) Precursor analysis of ionospheric GPSTEC variations before the 2010 M7.2 Baja California earthquake, *Geomatics, Natural Hazards and Risk*, 8:2, 295-308, DOI: 10.1080/19475705.2016.1208684

Y. B. Yao, P. Chen, S. Zhang, J. J. Chen, F. Yan, and W. F. Peng, Analysis of pre-earthquake ionospheric anomalies before the global $M = 7.0+$ earthquakes in 2010

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Actually, the case studies can be accepted now if something exclusive was detected or some original technology was applied. So let us consider what kind technologies of data processing and methodology of precursor identification were applied. 2. The only unique in the paper is the use of MIT TEC maps. Authors consider these maps probably as advantage because of “The advantage of MIT TEC is that it is strictly data driven with no underlying models that smooth out the real gradients in the TEC” in addition the maps have the higher temporal (5 min) and spatial (1°x1°) resolution in comparison with GIM TEC maps (IONEX). And here immediately some comments appear. Use of such kind of maps is possible if you have the distance between GPS receivers of order 100 km or less between them, so for such areas as oceans or Africa for example, such maps are not applicable. The linear regression without models is possible only if you have uniform distribution of receivers, otherwise you should use some interpolation procedures as Kriging, for example. So, the advantage of MIT TEC maps seems questionable. 3. My most concern is the use by authors the 24-hours averaging. This procedure could be compared with calculating the average temperature of patients through the whole hospital. Ionospheric anomalies before earthquakes are transient phenomena and don't last through the whole day, So the average daily TEC is senseless. Such procedure may be applied probably with long lasting increase of F10.7 index, or strong geomagnetic storm lasting several days, but not for ionospheric precursor's detection. Instead of use the mentioned by authors high temporal resolution of MIT TEC maps, they average them. In conclusion, I consider the obtained results questionable with application of not adequate technology of the precursor's identification and I'm forced do not recommend this paper for publication.

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