

Ann. Geophys. Discuss., referee comment RC1
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Comment on angeo-2022-1

Anonymous Referee #1

Referee comment on "Sounding of sporadic E layers from China Seismo-Electromagnetic Satellite (CSES) radio occultation and comparing with ionosonde measurements" by Chengkun Gan et al., Ann. Geophys. Discuss.,
<https://doi.org/10.5194/angeo-2022-1-RC1>, 2022

General comments:

The paper deals with radio occultation measurement of sporadic layers. It presents Es occurrence rate depending on seasons (Spring, Summer, Autumn) and heights (70 km to 120 km), and global distribution of Es during different seasons. Included is a chapter which compares radio occultation with ionosonde measurement. The paper is well and clearly written. I have following suggestions and questions to the authors:

1. Figure 3 and corresponding text deals with histograms of Es occurrence depending on height. The plots show number of Es observations in each height bin (resolution 1 km). My question is: is it possible to present the data as percentage of Es observation / total of measurement rather than absolute numbers? The authors discuss decreased number of Es observations in summer due to lack of data. I think that using relative number rather than absolute number can help with this issue.
2. Figure 7 shows electron density profiles by CSES and ZLT ionosonde. Could you please explain if the Es can be seen in the ionosonde derived profile (I cannot tell if the peak is Es or E layer) and if yes, give details about the electron density computation? Regarding this, I strongly suggest that you show ionogram which shows Es situation, not only computed electron density profiles.
3. The authors claim that the virtual height of Es can be influenced by the ionization of the ionosphere below Es. Can you estimate by how much can the $h'Es$ theoretically differ from real height of Es for your situation?
4. Could you please provide brief information about the ionosonde used and software

which computes electron density profile?

5. Figure 8 shows comparison of radio occultation Es heights vs. ionosonde derived heights. It shows a line $y=x$. In first two panels I had an impression that it is a regression line. I suggest that you show the regression line and corresponding statistical coefficients describing the regression line.

Small changes:

Please change "we first calculates...", and "then extracts..." in page 3.