RC1:
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:

Thank you very much for your positive suggestions and careful reminding on our manuscript to improve the quality of it.

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.

Thanks for your nice suggestions, your suggestion really means a lot to us. Yes, using relative number rather than absolute number can help with this issue. We will change this in the revised manuscript. Thank you again for your point out.

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.

Thanks for your reminding. We are sorry for the misunderstanding caused by Figure 7. In order to better tell the peak is Es rather than E layer, we reselect an example to illustrate the situation of Es. The data of ionosonde is stored in SAO format files, the virtual height of Es and electron density profiles can be obtained directly in the SAO format files of ZLT ionosonde.
Thanks for your nice suggestions. we will add the ionogram image of Wuhan ZLT ionosonde to show Es situation more clearly.
We will include them in the revised manuscript.

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?

Thanks for your suggestions. The height offset is mainly concentrated in 100-110km of ionosonde altitude, and the calculation results of different space-time windows are

different. The mean offset values in 100-110km are 2.36km, 2.25km, 2.90km, and 3.09km, which correspond to space-time matching windows (10°, 10°, 7.5 min), (5°, 10°, 7.5min), (5°, 5°, 7.5min) and (2°, 5°, 7.5min), respectively. We will include them in the revised manuscript.

4. Could you please provide brief information about the ionosonde used and software which computes electron density profile?

Thanks for your suggestions. The data of ionosonde is stored in SAO format files, this data file contains different types of parameters, such as station information and detection time, ionospheric characteristic parameters for automatic measurements, echo traces (virtual height, amplitude, doppler, frequency) at different height layers of the ionosphere (E, F1, F2), electron density profiles, virtual height and critical frequency of Es trace, etc. The SAO format description can refer to https://ulcar.uml.edu/~iag/SAO-4.htm. So, we directly read the electron density profile and plotted the image.
As for related software, in order to facilitate the reading and use of data, SAOExplorer software (http://ulcar.uml.edu/SAO-X/SAO-X.html) has been developed by the Center for Atmospheric Research at the University of Massachusetts Lowell, USA, to display and measure Digisonde Ionospheric frequency map observed by a series of ionospheric altimeters.
We will include them in the revised manuscript.

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.

Thanks for your valuable suggestions. Our original purpose of drawing the line y=x is to facilitate the reader to compare the degree of deviation of radio occultation Es heights and ionosonde derived heights from y=x. Yes, it would be more understandable if we show the regression line and corresponding statistical coefficients describing the regression line. Thank you again for your suggestions to improve the quality of our manuscript. We will include them in the revised manuscript.

Small changes:

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

Thanks for your careful checks. We will change them in the revised manuscript.