

Interactive comment on “Spatial and seasonal effects on the delayed ionospheric response to solar EUV changes” by Erik Schmölder et al.

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This manuscript mainly focused on the temporal and spatial variation of the delayed response of terrestrial ionosphere to the solar EUV flux changes that related to the solar rotation. This is an interesting study, and the paper is publishable in AG. However, there are some issues to be addressed before it is formally accepted for publication.

1. In Figure 3, the authors compared the correlation coefficients and the time delay retrieved from two datasets by fixing local time or fixing location. The authors should note that the time delay of ionosphere to the solar EUV flux change depends on solar local time. The time delay inferred from fixed location dataset can be partly considered as the averaged delay at different local times. The authors should point out this issue.

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2. The time delay of ionospheric parameters is the key in this analysis. The difference between the time delay by using the 2 methods is greater than 4 hours. How about the uncertainty of the obtained time delay? In addition, the diurnal variation of ionospheric parameters may affect the calculation of time delay. They can provide the time delay by removing the diurnal variation in Figure 3. 3. Is the time delay reliable as the correlation coefficient is less than 0.4? 4. How do they calculate the Kp index, the red line in Figure 4? 5. In Figure 4, the Kp index, the correlation coefficient and time delay show similar decreases during the end of each year. The authors indicated that the lower correlation coefficient and time delay should be related to the corresponding lower geomagnetic activity. Why the correlation coefficient is lower when the geomagnetic disturbance (Kp) is lower? 6. In Figures 11 and 12, the time delay generally does not change with latitude in winter. Whereas, during winter time the correlation coefficient is nearly 0 as seen in Figure 4. Therefore, the absolute values of the correlation coefficient should be provided in Figures 11 and 12.

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