

We thank referee #1 for careful reading and valuable comments on the manuscript. Accordingly, we have modified the text. All the modifications and changes are shown in the revised manuscript in red font. Our responses to the referee's comments are listed below.

### **Response to Referee #1**

#### **COMMENTS TO THE AUTHOR:**

Referee #1: Interactive comment on "Validation and application of optimal ionospheric shell height model for single-site TEC estimation" by Jiaqi Zhao and Chen Zhou

Comments:

The manuscript is well written and clear. This paper models the optimal thin layer altitude as 40th order Fourier series. The optimal altitude coefficients are estimated at a reference station and used for estimating the thin shell altitude of the near stations. This approach is very useful for precisely estimating the TEC and DCB in not IGS platform.

#### Reply:

We thank the referee for the encouraging evaluation on our study, which has driven us into a deeper investigation.

It would be interesting to see what are the performances in DCB estimation if the number of coefficients of the Fourier series changes, it would be interesting to see what is the minim number of coefficients required.

#### Reply:

We thank the referee for this valuable comment. In our study, the order of Fourier

series is preliminarily set to 40. For one station, the outstanding frequencies of optimal thin layer altitude are only a few, it is possible to reduce the number of coefficients. Maybe less coefficient, clearer physical relationship.

There is in addition a typo comment, on page 7 line 132, you should insert the IPP acronym that has not been specified before.

Reply:

We thanks the referee for careful reading and pointing out this mistake. We have corrected it. Please see page 7 line 135 in the revised manuscript.