Author's Response to Referee #1

We would like to thank referee #1 for the positive review of our manuscript. We have answered all comments below (for easier comparison the referee comments are included in *italic*).

Specific comments:

#1: The authors proposed a 3-D model, and however they only showed the mean banding angle profiles averaged over all longitudes at 0° geographic latitude in this paper. Therefore, the reviewer suggests that the title of the paper should include the term "equator" or it should be emphasized in the Introduction or Data set sections (e.g. page 1160, after line 7) that the model is only applicable to the 0° latitudinal band.

#1: We considered your suggestion to change the title, but decided then to leave it as it is. The reason is that the restriction to the equator is caused by problems in the simulated data, not the error model. Nevertheless, we will add the following sentence to p. 1160, after line 7: "In this framework it was not possible to perform a thorough latitudinal investigation, but in a follow up study it is planned to investigate the model at all latitudes."

#2: The longitudinal variation in the ionospheric plasma density is significant near 0° geographic latitude even in the same local time. One of the reasons is that the geographic and geomagnetic equators are not overlapped, and the distribution of ionospheric plasma density is highly controlled by the geometry of geomagnetic field lines. Accordingly, the question is, how is the capability of the new model in different longitudes?

#2: We decided to add an extra paragraph about this on p. 1155, after line 19:

"The model does not correct for the residual ionospheric error that arises from horizontal gradients of the ionosphere, or those errors that are caused by the Earth's magnetic field (see companion paper Healy and Culverwell (2015)). These errors could have an effect on individual profiles\footnote{Although Syndergaard (2000) argued that the geomagnetic term has no appreciable impact on the residual ionospheric errors in GPS-RO applications}, but they should average out of the zonal monthly mean climatologies which are the focus of our study here."