

Reference: Manuscript MS amt-2011-24

"The Impact Of Large Scale Ionospheric Structure On Radio Occultation Retrievals"  
Mannucci, Ao, Pi, Iijima

Responses to referee #1:

*Page 2535, Line 23-24: "... that often occur simultaneously during storms: overall electron density values increase as do their spatial gradients." Is it accurate? Actually negative ionospheric storm effects happen quite often.*

Yes, negative storms occur also. Negative storms will decrease the residual ionospheric bias, except in regions of large electron density spatial gradients. We have revised the text to acknowledge this case.

*Page 2540, Line 26: "S/C location"? What does S/C stand for? spacecraft?*

We have revised the text to clarify.

*Page 2542, Line 25-27: Could the different initial heights used for temperature retrieval explain the difference of temperature errors between Kursinski simulation and the one done by the authors?  
Check the spell "Kursinski", which has several different versions in the paper.*

We have now revised the paper to include only refractivity retrievals. This avoids the issue. The complexity introduced related to your question detracts from the main conclusions of the paper.

*Page 2543, Line 6: "~0.3 K for the quiet case". What I see from Fig. 14 is ~0.5 K temperature bias at 25 km for the quiet case.*

This is an error on our part. In the revision, this figure is not present.

*Page 2544, Line 18-21: "Ionospheric residual is sensitive to ... because ... of low Earth orbiting receivers". Not clear.*

We will clarify this sentence: Ionospheric residual is sensitive to spacecraft altitude when the vertical distribution of ionospheric electron density reaches a peak near orbital altitudes of low Earth orbiting receivers.

*Page 2546, Line 3: what is "mitigating strategies"?*

Revision: so that approaches to mitigating the impact can be devised.

*Caption of Fig. 1: not right. Correct it.*

Corrected version: The altitude of the simulated ray versus distance along the ray, starting at 1600 km altitude. Zero distance is at the ray tangent point. The receiver is on-board CHAMP (400 km altitude orbit).

*Fig. 8: what is that nasty structure shown at the end close to the GPS satellite?*

This is due to the finite difference calculation used to compute the refractivity gradients from the GAIM model. The calculation creates numerical “noise”.