Final Author Comments to Anonymous Referee #2 review "Identification and localization of layers in the ionosphere using the eikonal and amplitude of radio occultation signals" by A. G. Pavelyev et al.

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The paper briefly reviews and presents a method to analyse GNSS RO signals with respect to inclined ionospheric layers by identifying variations at 30-90 km. The topic is suitable for AMTD. The paper is generally well written and the manuscript may be of interest to readers who analyse GNSS signals.
The main point of concern, in my opinion is that both the introduction/review of methods and the presentation of the model strongly refer to literature. Thus the reader has to know and read the literature to fully understand the review, but then it becomes unclear why there is such discussion. The presentation of the model strongly refers to publications, too, so that it remains unclear what is really new in the paper. This must be clarified in the revised version, and the model description should be elaborated. I am sure that the rating for "Scientific Quality" can be easily raised to "Good" by the authors.

In the revised version we clarify new elements in the paper:

(1) The amplitude variations of RO signal are similar to the noisy-C-type and regular – S-type scintillations detected earlier in the communication link satellite-to-Earth. These types correspond to different effects when radio waves propagate through the ionosphere. The regular types are relevant to wave-like structures and layers. The noisy events may be due to scattering by irregularities and turbulence in the ionosphere. These types are useful for understanding the nature of the ionospheric interferences on communication links satellite-to-satellite and satellite-to-Earth.

(2) A criterion for identification of layers in the ionosphere is formulated and eikonal acceleration/intensity technique is introduced for measurements of the altitude, displacement and inclination of the ionospheric layers.

(3) Analytical expression describing the refractive attenuation, bending angle, and eikonal excess for a medium consisting of locally spherically symmetric sectors is presented. Analytical model can have general application for modeling of conditions of communications, surveillance and navigation in the near earth medium. As applied to RO data analysis analytical model explains correlated variations of the eikonal and intensity of RO signals at 30-90 km altitude of the RO ray perigee as a contribution of inclined layers in the ionosphere. This allows removing systematic errors in RO estimation of the altitude of ionospheric layers.

Minor items: Page 1470: Please provide motivation and more explanation why there are 5 types of ionospheric influence, may be some reference will help.

In the revised version of our paper we compared and supported our results by data of Karasawa et al., 1985, for communication link satellite to Earth. Karasawa et al., 1985 introduced two

types of the ionospheric impact on the amplitude of radio waves: regular (S-type) and noisy (C-type). Noisy (C-type) described by Karasawa et al., 1985 corresponds to noisy RO events. Regular (S-type) is relevant to three types: quasi-regular (wave-structures), regular spikes (contribution of a single layer), and, to more complex, diffractive features in the amplitude and phase data).

Page 1473, line 23: why unexpected?

We excluded this in the revised version of our paper

Page 1476, line 23: Pavelyev et al., 2010b.

We corrected this in the revised version of our paper

Language and typos:

Page 1469, line13: suggestion -> the suggestion Page 1469, line13: delete “the” before

“inclination” Page 1469, line 16: equations -> the equations Page 1472, line 24: delete

“to” after “satisfy” Page 1473, line 1: “to the ray” -> “and the ray” Page 1473, line 10:

“to the case” -> “for the case” Page 1464, lines 9 and 26: next -> following Page 1475,

line 5: ... in this case we can observe... Page 1477, line 19: delete “to” before “below”

Page 1478, line 19/20: Abel transform Page 1479, line 2: mˆt3 -> mˆ3

We introduced necessary corrections in the revised version of our paper

Page	Line	Mark No.	Comment
1469	13	1,2	OK
1469	16		OK
1472	24		OK
1473	1		OK
1473	10		OK
1474	9,26	1,2	OK
1475	5		in this case we can observe
1477	19		OK
1478	19/20		application of the Abel transform
1479	2		[electrons/m^3]