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Interactive comment on "Whistler waves produced by monochromatic currents in the low nighttime ionosphere" *by* Vera G. Mizonova and Peter A. Bespalov

Anonymous Referee #1

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Discussion of the paper by Vera G. Mizonova and Peter A. Bespalov "Whistler waves produced by monochromatic currents in the low nighttime ionosphere", submitted to ANGEO.

The paper deals with the problem of whistler mode waves excitation by a monochromatic current placed at a certain level in the lower ionosphere. The authors aim at calculating the electromagnetic field on the ground and at a certain level above the source region, using the full-wave approach. This problem is of undoubted interest for ANGEO.

I begin with minor remarks which arise when reading the manuscript.

1. When presenting the density profile and the profile of collision frequency, the authors refer to IRI model. As far as I know, IRI model does not provide collision frequency, at least, the URL given in the text does not lead to a site from which the collision frequency can be inferred. Thus, the given reference appears to be misleading.

2. Figure labels are too small and hardly readable.

3. Formular on page 5, line 20 is cut.

4. The sentence on page 8, line 4, starting with "Since a wave . . ." seems to be incomplete, or the dot should be replaced by a comma.

5. Page 9, line 6. Poynting vector has incorrect dimension.

6. In the Discussion and Conclusions, which follow one after another, there are almost word-for-word repetitions.

7. Although the presentation is clear, there are some mistakes in English usage. For example, p.1, line 11, "by a now" should be changed to "by now". In the Acknowledgements, "was performed" should by replaced by "were performed".

8. However, a serious point consists in the following. The authors claim that they solve the problem under conditions that "The source current is located in the horizontal plane and can have arbitrary distribution over horizontal coordinates". This claim is then repeated in Discussion. However, the authors only explain in detail how they find the field harmonics, stating that "The coordinate dependence of the wave field can be found from the inverse Fourier transform (10)" – is it that easy? It is impossible to find numerically the Fourier transform for all n_\perp, thus formular (10), to which the authors refer, being suitable for analytical calculations, does not make much sense in the case of numerical ones. This point, which is commented in the text by one sentence, even few times ("Inverse Fourier transform yields space dependence of the wave field") needs a detailed explanation. How, using (10), have the authors found the field in coordinate presentation from inevitably discrete and finite number of Fourier

transforms?

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