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Interactive comment on "Invariants of the Spatial-Energy Structure and Modeling of the Earth's Ion Radiation Belts" *by* Alexander S. Kovtyukh

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I am very grateful to the Referee for these comments: they help clarify the essence of my work and I, of course, will make all the necessary changes in the revised manuscript. In many places of this manuscript, starting with the title, the word "model" is found and in almost all cases this word has the most general meaning here: any observation or measurement is a physical model (modeled by instruments or a brain). But in fact, no empirical or mathematical models are used in this manuscript, and what is presented in Fig. 1-9, these are collections of experimental data. Associations with models (in the narrow sense) also invoke the word "parameters". What presented

here, in section 2, and called the invariant parameters of ERB are not the parameters of mathematical or empirical models of ERB. These parameters obtained directly from the results of various experiments, from the figures of the corresponding articles. They were found for each energy spectrum and for each dependence from L of the ions fluxes, and only then these parameters were averaged (separately for each ion component). These invariants exist only in the region where the transport (radial diffusion) of ions dominates their losses. With increasing B/B0, the rate of radial diffusion of ions decreases, and the rate of their loss increases rapidly. Therefore, on small L and for large B/B0, these invariants are not applicable to ERB and in Figs. 7-9 they are not presented (these figures are given only for completeness). Author's papers in journals Cosmic Res. and Geomagn. Aeron. (in English) can be found in any major university library. But in order to make sure that there are such invariants and in the correctness of the values given here, it is not necessary to read these articles. It is enough to open several articles where there are experimental spectra or radial profiles of ion fluxes with E > 0.1 MeV for L > 3, obtained in quiet periods near the equatorial plane. I will take into account all these remarks and the words "model" and "parameter" will be saved only where it says about specific ERB models. I checked the descriptions of the figures and added them with the necessary explanations. I agree that I don't speak English well enough and gratefully accept any corrections to the text of the manuscript.

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