We thank the reviewer for the comments. Answers are given below in red. Changes in the revised version of the paper are also in red.

Reviewer #2

Dear authors and editor,

the manuscript "Simulation of a lithosphere-atmosphere-ionosphere electromagnetic coupling prior to the Wenchuan MS 8.0 earthquake" by Mei Li, Zhuangkai Wang, Chen Zhou, Handong Tan, and Meng Cao is an interesting research devoted to modeling the propagation of electro-magnetic anomalies produced by pre- and coseismic processes associated with the occurrence of the large Mw 7.9-8.2 2008 Sichuan event.

While the topic presents high scientific significance and the article is based on definitely good scientific research quality, I think that it suffers from a number of weaknesses preventing me to support its publication in NHESS if not after a major revision; however, the decision must go to the editor.

Below my major comments that I think should be addressed before the manuscript can be considered for publication:

1) The abstract should be a short, clear message summarising the content of the paper in a simple way that should be readable by non experts: addressed problem, state of the art, fundamentals of models, main idea, main result and its interpretation.

   Simple, direct: a take home message. Authors' abstract does not go to the point, it is complex, I cannot understand what you did in your study just reading it.

   We thank the reviewer for his comments on the abstract of the paper and we rewrite it completely in the revised version of the paper in red.

2) Several sentences in the main text are confusing, too long and contain language mistakes: I suggested several improvements in the attached pdf file to make the manuscript more enjoyable to readers.

   All mistakes labeled by the reviewer have been modified in red in the revised version of the paper.

3) Observations and simulations should not be confused: I think that a chapter devoted to show observations with maps etc should be added after the paragraphs devoted to models and then, discussions should be more focused on the

comparison of models and actual observations. Quantitative analysis to understand if the model works appropriately should be done (e.g., misfit assessment etc).

The main topic of this paper focuses on electromagnetic energy propagation from lithosphere (the hypocenter of the Wenhcuan EQ), via atmosphere, to the ionosphere to quantitatively establish a LAIEC model associated with the Wenchuan earthquake on the basis of real-time ULF electromagnetic observations (ground-based Gaobeidian station) and reported ionospheric observations prior to the Wenchuan event.

We have added some real-time recording pictures into Section 2 to display some related anomalous ULF electromagnetic information recorded prior to the Wenchuan earthquake. According to these recorded anomalous signals, the possible seismo-telluric current will be calculated using a finite-length electrical dipole in a half-space model. This current will act as the "energy source" to drive the total LAIEC process related to the Wenchuan earthquake. And then, the electric field penetration model and the TIE-GCM have also employed to simulate and calculate the propagating processes of the electromagnetic information in the atmosphere and ionosphere, as well as ionospheric variations caused by the additional electric field at the bottom of the ionosphere. During this period, many parameters have to be specified. However, giving accurate values to these parameters is difficult, which could lead to some uncertainties on our results. On this point, we have also discussed these uncertainties in Discussion section in the revised version of the paper.

4) It is not always clear which output of the model is compatible with physical phenomenons and which apparent signals are instead due to spurious effects, random fluctuations, computational instabilities (e.g., the red spot at the top of the two-peakes red anomaly in Figure 4 at about 180 km in height and 0 magnetic south-nord. Is it an artifact of the model?). Limits and hypotheses below the models should be sufficiently discussed.

It has been testified that the "hot-dot" in Figure 4 at about 180 km height is caused by the distortion in the central of the input ground surface electric source. The surface calculated electric values near the ground source central (the projection on the ground surface of the underground finite length dipole) are not accurate due to theoretical calculation method. We have added some comments in the reversion of the paper in red.

Minor comments, discretionary requests, suggestions and corrections of minor mistakes are listed throughout the attached pdf file for the sake of simplicity.

They have been corrected in the revised version of the paper.

Thanks for allowing me to review this work and for taking into account my humble comments.

We thank the reviewer for his careful comments. And further comments are welcome if it is necessary.