Interactive comment on "Post-processing scheme for modeling the lithospheric magnetic field" *by* V. Lesur et al.

Anonymous Referee #1

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This paper deals with satellite magnetic data noise modeling. In general, before interpreting geomagnetic data, an elaboration step is necessary in order to remove magnetic fields components not related to geological structures or to everything scientists want to investigate by means of earth magnetic field. Sometimes this elaboration step is not perfectly performed because of mathematical models limits. These errors can affect lithospheric modeling The authors try to analyze the errors correlated along satellite data tracks in order to build a model able to describe and evaluate the residual noise in lithospheric modeling. The topic seems very interesting and scientists can be benefited by lithospheric noise modeling. However the paper needs major revision before the publication. That's because, after reading the article, a scientist dealing with magnetic field should be able to reproduce the experiments and the computations shown in the paper. In my opinion, some parts of the work

are not clear enough to reproduce the authors' work (see detailed comments on supplement) and a more exhaustive explanation with more equations is required (see detailed comments on supplement). Moreover, in my opinion, the method is not enough validated to be considered a good operative algorithm. A synthetic test would be a good example to show the quality of the showed technique. The most important point to check is the estimate of the errors for gauss coefficients and perturbation model coefficients .I suggest to "generate" a lithospheric field model and a noise field with known input coefficients and calculate the synthetic measured field. After this, evaluate the differences between these input coefficients and the ones got with the inversion proposed Finally the authors can apply the leveling or other traditional techniques on the synthetic noised field and compare the two results in order to see the improvement got with the proposed algorithm.

Please also note the supplement to this comment:
http://www.solid-earth-discuss.net/4/C650/2012/sed-4-C650-2012-supplement.pdf

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