Responses to reviewer2 comments on the paper titled: Multi-scale analysis and Modeling of aeromagnetic data over the Bétaré-Oya area in the Eastern Cameroon, for structural evidence investigations.

Dear Chief Editor,

In general, all the reviewer 2 remarks, and recommendations have been taken into consideration. The authors make changes and suggestion in yellow in the MS text, but in blue below responses are given to all the remarks. The authors are indebted to him/her for his/her valuable remarks.

Reviewer2: Anonymous

1. As the only observed magnetic dataset used in this study, the original locations and intensities of the aeromagnetic data should be shown: The original data set belongs to the Ministry of Mines, Industry & Technological Development. We got the TMI maps for our use, with a condition of not sharing with a third party. We digitized them and then, got all the results that are in the present manuscript submitted for publication. We are sorry not to be able to give:

2. What are the new findings in this manuscript compared to previous studies? Is it that in this work the sub-surface tectonic structures were for the first time related to the magnetic data?: The subsurface tectonic structures are for the first time related to the magnetic data, but we can mention the fact that, some other geophysical methods are used in investigating neighbouring areas respectively in the southern part (Pepogo et al., 2018, using audiomagnetotellurics soundings, Tadjou et al., 2009 by modelling and interpreting gravity data) and the southern East part (Owono-Amougou et al., 2019). All these previous studies are cited in the sub-section 2.3. Our results are corelated to those from other geophysical studies realized in surrounding sites by using the methods cited above. Here they are:

i)-Several major families of faults were mapped. Their orientations are ENE-WSW, E-W, NW-SE, N-S with a NE-SW prevalence. The latter are predominantly sub-vertical with NW and SW dips and appear to be prospective for the future mining investigation.

ii)-The evidence of compression, folding and shearing axis, was concluded from superposition of null contours of the tilt-derivative and Euler deconvolution. The evidence of the local tectonics principally due to several deformation episodes (D1, D2 and D4) associated with NE-SW, E-W, and NW-SE events, respectively.

iii)- Depths of interpreted faults ranges from 1000 to 3400 m.

iv)- Several linear structures correlating with known mylonitic veins were identified. These are associated with the Lom faults and represent the contacts between the Lom series and the granito-gneissic rocks; we concluded the intense folding caused by senestral and dextral NE-SW and NW-SE stumps.

v)- We propose a structural model of the top of the crust (schists, gneisses, granites) that delineates principal intrusions (porphyroid granite, garnet gneiss, syenites, micaschists, Graphite and Garnet gneiss) responsible for the observed anomalies. The 2.75D modeling revealed; many faults with a depth greater than 1200 m and confirmed the observations from RTE-TMI, Tilt derivative and Euler deconvolution.

vi)- We developed lithologic profile of Betare Oya basin.

3. How to evaluate the error and role of the 2.75D modelling to obtain new regional results in this study?: The error on our 2.75 D model is evaluated by minimizing the difference between the measured value and the theoretical curve automatically generated by the GM-SYS operator. The smaller this difference, the acceptable are the values obtained. The role of 2.75 D modeling is to bring out an imagery of the different geological layers in the subsoil, responsible of the magnetic responses obtained at the surface

I humbly hope that the clarifications on the corrections made after the reviewer 2 remarks & recommendations are satisfactory.

Your kind reaction is awaited.

Sincerely yours