Authors' Response to Reviews of

Electron radiation belt safety indices based on the SafeSpace modelling pipeline and dedicated to the internal charging risk

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ANGEO,

RC: ***Reviewers' Comment***, AR: Authors' Response, □ Manuscript Text

1. Response to refree comments from Yihua Zheng

RC: ***Typo and rephrasing comments :***

- ***Change 'radiative' to 'radiation' (throughout the paper)***
- ***The space weather impacts (around lines 30-35) related to 'satellite drag' and 'communication and navigation' are not really related to energetic particles.***
- ***Around line 220 'On the MEO orbit'. -> 'At the MEO orbit' and -> 'On the LEO…'. -> 'At the LEO orbit'***
- ***Around 220, the following sentence is difficult to understand***
- ***Between lines 230-235 'LEO,MEO,GEO' -> it should have some proper spacing. 'LEO,MEO,GEO'***
- ***After line 240. 'With no doubts' -> 'Without a doubt'***
- ***Between lines 235 – 240, this sentence is unclear***
- ***Around line 245, '(Ripoll et al., 2023).As a…' -> need a space in between two sentences***
- ***After line 245, 'In front of the poor results' -> 'With regard to the poor results'***

AR: All suggested modifications and corrections were added in the final version of the manuscript.

RC: ***I would like to see more discussions on how to possibly make improvements regarding the poor performance at LEO.***

AR: We suggest three improvements in order to upgrade the poor performance at LEO. Two of them are numerical and are related to the grid refinement near the loss cone (on the y and L^* grid) and the transition to a dedicated numerical scheme that handles diffusion problems with strong gradients. Unfortunately, the first improvement makes the SafeSpace pipeline obsolete due to the introduced computational cost. Finally, we advocate for a review of the physical modelling of the inner belt dynamic that is incomplete and its improvement in the medium term. We rephrased and clarified the last sentences related to these improvement in the final version of the manuscript.