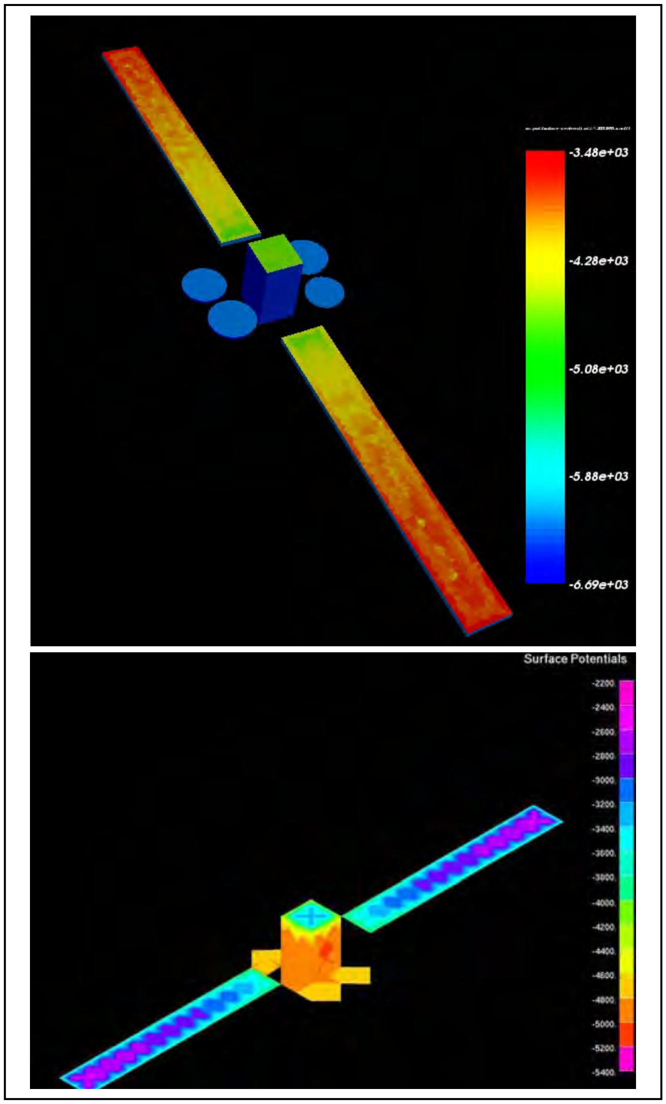

Fig. 22. Solar array potential evolution on solar wings (t= 2000s)

IV. CONCLUSION

This paper presents significant modelling efforts given to the numerical simulation and comparison of results obtained with two major spacecraft charging analysis tools. In the studied configurations, all in GEO, the results agree qualitatively and also quantitatively. The difference is about 20%, which is deemed satisfactory given the differences in the modelling approaches. The importance of secondary electron emission under electron, photon and proton impact was illustrated, which is not always mentioned for the latter (proton impact). The eclipse exit situation is reproduced and gives perspectives in terms of representativity of the electrostatic discharge risk during that period. Differential charging on cover glasses is enhanced due to still cold materials.

As a first perspective of this work, we suggest to use the SPIS-GEO capability of varying dielectric conductivity as a function of time in eclipse and during eclipse exit. It would add to the precision of the simulation by using results from thermal balance assessment. Another issue concerns the use of material properties as a function of life time, taking into account ageing under space radiations. Finally, the next generation of "all electric" spacecraft offers challenging issues, that could be dealt by using and upgrading SPIS capabilities offered by the ESA AISEPS activity [11].

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