

## SINAS: Benefits and points of attention

*Thursday, 10 October 2019 12:30 (30 minutes)*

The accuracy of thermal analysis relies to a large extent on the nodal discretisation and conduction calculation/definition in the thermal model. Traditional methods of conductor calculation use simplified analytical rules and can be very user intensive or require large simplifications. The work presented at ECSSMET 2018 [1]&[2] and ESTEW 2018 [3] considering thermal mapping and FEM based conductor generation respectively, has shown how the software SINAS [4] can improve the accuracy of thermal and thermo-elastic analyses whilst possibly also reducing the user's workload.

Recent developments in the software have improved the accessibility of SINAS through a Python version with a unified interface. With these recent updates SINAS has become more available for the general public and therefore, an increase in the number of users is expected.

ATG has extensive experience using SINAS, including the new PySINAS interface. Through practical examples, ATG wants to provide guidelines and examples for the different possible uses of the python version of SINAS. These examples will highlight the benefits of software but will at the same time also focus on problems which are expected to be most relevant to new users of the software.

### REFERENCES

[1] Temperature Mapping For Structural Thermo-Elastic Analyses; Method Benchmarking.

Menno Koot, Simon Appel, Samo Simonian.

Presented at the ECSSMET 2018, ESTEC, Noordwijk, The Netherlands

[2] Thermal Conductor Generation For Thermal And Thermo-Elastic Analysis Using A Finite Element Model and SINAS.

Menno Koot, Simon Appel, Samo Simonian.

Presented at the ECSSMET 2018, ESTEC, Noordwijk, The Netherlands

[3] Accurate thermal mapping and Finite Element Model based Conductor Generation; extended method benchmarking guidelines

Menno Koot, Alexander van Oostrum, Iñigo Urcelay, Victor Sutii, Simon Appel

Presented at the ESTEW 2018, ESTEC, Noordwijk, The Netherlands

[4] SINAS IV: Interpolation of lumped parameter thermal node temperatures (from e.g. ESATAN) to thermo-elastic input data (with MSC. NASTRAN)

<https://exchange.esa.int/restricted/sinas/>

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