

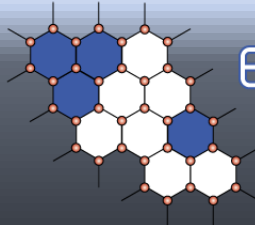
Appendix H

Improved Integrated Way of Post-processing Thermal Model Data


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Abstract

Post-processing of the thermal results is a significant part of the overall thermal modelling process. Clear presentation of results not only helps towards the understanding of the thermal behaviour of the model, but also helps towards model validation. This presentation focuses on how ESATAN-TMS 2018 further helps the thermal engineer to work efficiently, eliminating repetitiveness by making the process fully automatic and integrated within a single interface.

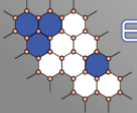


ESATAN-TMS
thermal modelling suite



ESATAN-TMS Post-Processing tool

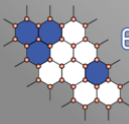
Nicolas Bures



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Summary of the Presentation

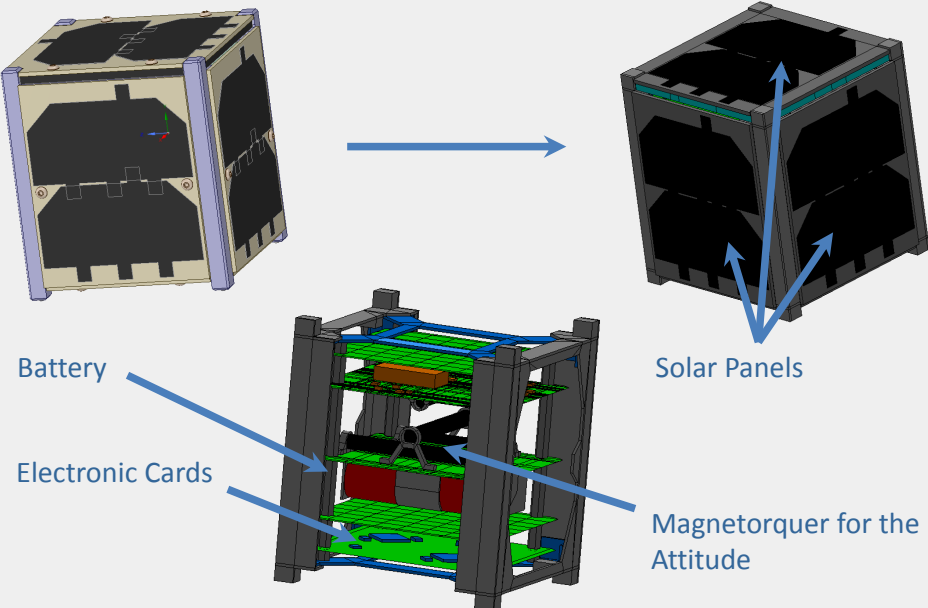
- Summary of the CubeSat provided by Melbourne University
 - Provided as a .stp file, converted using CADbench
- Presentation of the requirements
 - Temperature of different components will be plotted using charts for multiple cases
 - Cases will be compared to evaluate the temperature change and temperature evolution using a Delta Chart
 - Temperature requirements will be verified using a Limits Chart
- Demo
 - A typical post-processing example will be presented using the new version of ESATAN-TMS

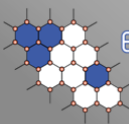


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Model Presentation

- Thermal design created in ESATAN-TMS, imported from CADbench

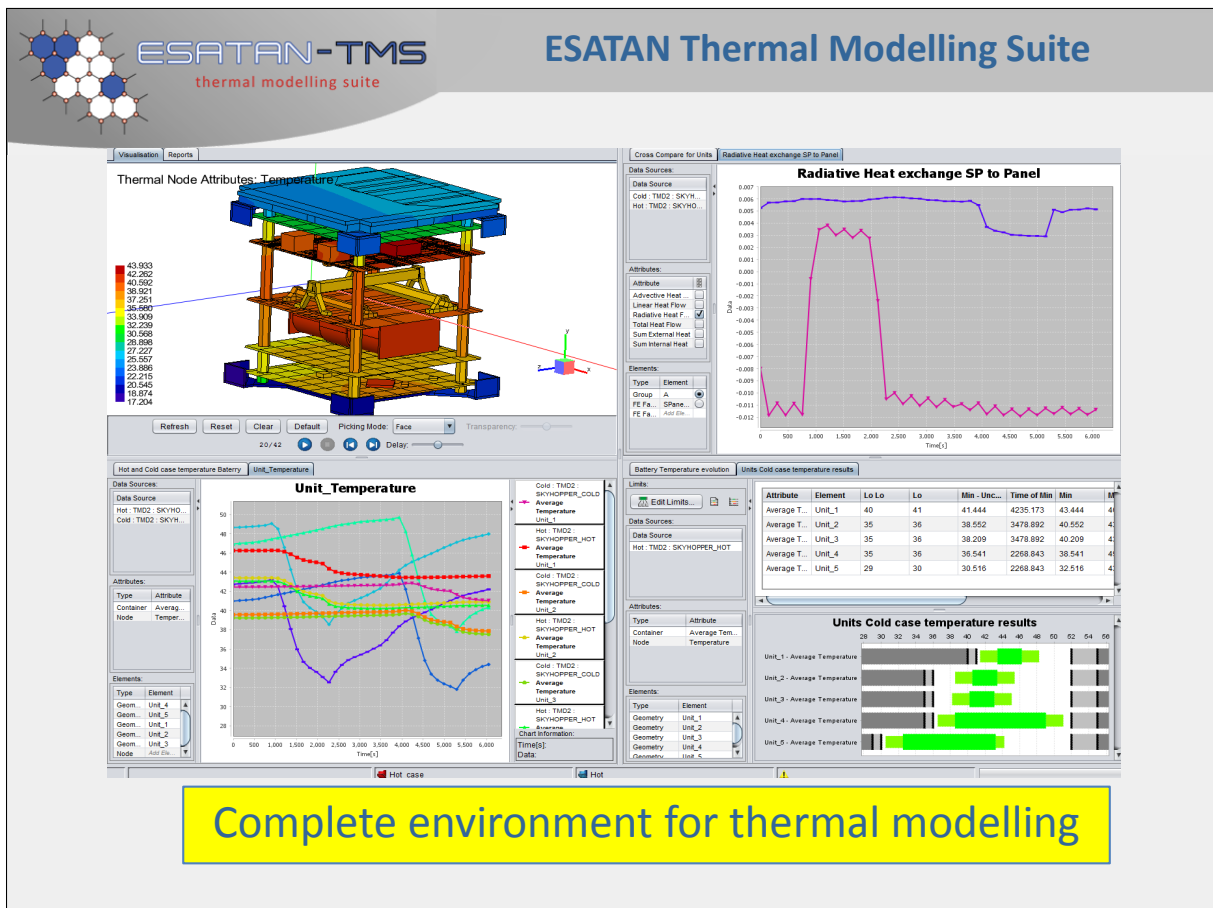




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Thermal Requirements

- Temperature requirements
 - Units 1 to 5 located on different electronic cards in the model are constrained by temperature requirements provided by the supplier
 - The battery temperature must strictly be between 35 and 50 degrees for both the hot and cold case
- Heat exchange requirements
 - The radiative heat exchange between Solar_Cell_10 and the Solar_Panel_6 structure must be negligible (less than 1W)
- The model shall be exported and provided as a text file to the customer



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ESATAN Thermal Modelling Suite

Thermal Node Attributes: Temperature

Radiative Heat exchange SP to Panel

Attribute	Element	Lo	Lo	Min - Unc...	Time of Min	Min
Average T...	Unit_1	40	41	41.444	4235.173	43.444
Average T...	Unit_2	35	36	38.552	3478.892	40.552
Average T...	Unit_3	35	36	38.209	3478.892	40.209
Average T...	Unit_4	35	36	36.541	2268.843	38.541
Average T...	Unit_5	29	30	30.516	2268.843	32.516

Unit Temperature

Units Cold case temperature results

Unit	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56
Unit_1 - Average Temperature															
Unit_2 - Average Temperature															
Unit_3 - Average Temperature															
Unit_4 - Average Temperature															
Unit_5 - Average Temperature															

Easy and user friendly interface

ESATAN-TMS
thermal modelling suite

www.esatan-tms.com