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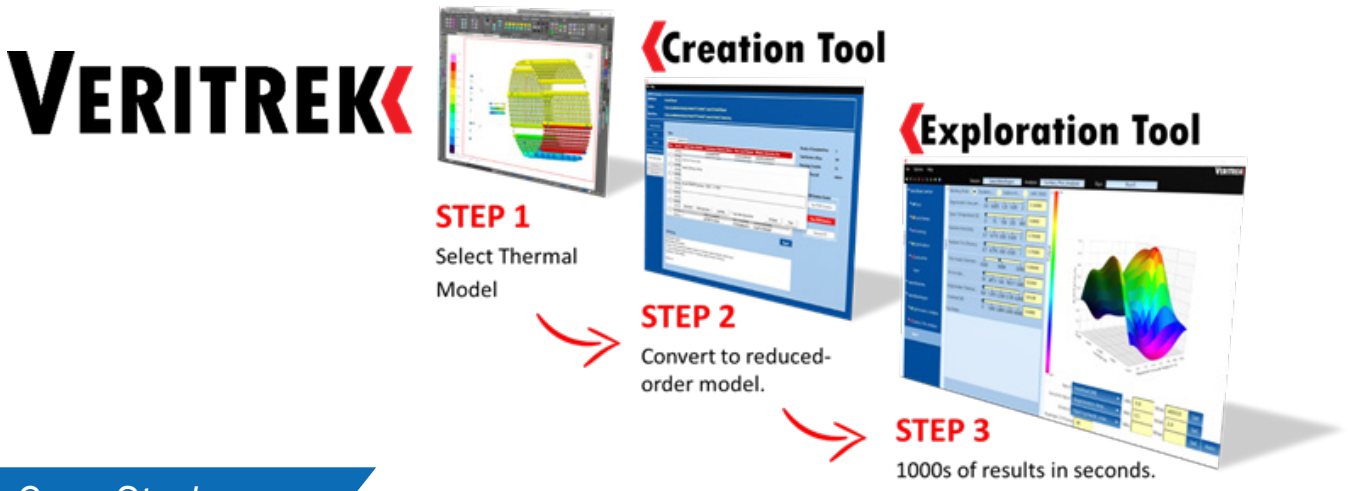


Image Credit: Redwire Space

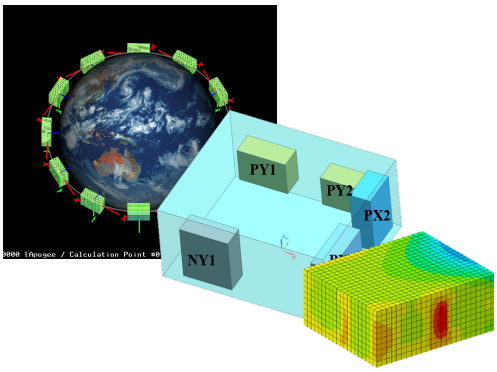
Case Study

Veritrek Custom Process Automation Software Development

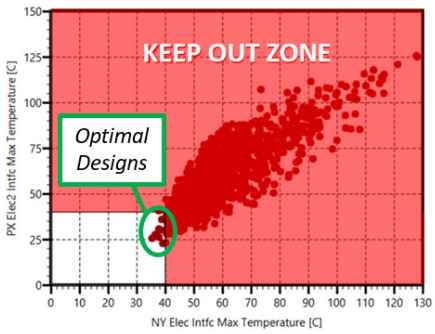
OVERVIEW

Veritrek software, developed by Redwire Space, enables exploration, verification, and improvement of thermal designs with speed and accuracy that are not feasible with traditional analysis techniques. Veritrek achieves this by converting a high-fidelity Thermal Desktop® model to an accurate reduced-order model (ROM) using automated training data generation, data fitting, and validation techniques. This ROM empowers users to quickly evaluate input factor/output response relationships.

ATA Engineering supported Redwire Space with Veritrek development by creating custom software that utilizes the Cullimore & Ring Thermal Desktop application programming interface (API) to automatically interrogate and sample the design space of Thermal Desktop models for ROM training.



ATA's case study defined orbital heating for a detailed Thermal Desktop model of a small satellite



Veritrek's ROM was able to rapidly identify optimal radiator designs to meet thermal requirements for satellite electronics

TASKS PERFORMED & KEY OUTCOMES

- Creation of software tools that utilize the Thermal Desktop API to query user Thermal Desktop models to define available thermal design parameters.
- Creation of software tools that utilize the Thermal Desktop API to automatically generate high-fidelity Thermal Desktop models that sample the design space, execute model simulations, and deliver results to the Veritrek ROM creation tool.
- Development of the Creation Tool graphical user interface for convenient integration of API tools with the Veritrek user workflow.
- Support of Redwire Space's Veritrek marketing efforts through development of a user case study to optimize small satellite thermal design and presentation of results to the aerospace community at NASA's Thermal and Fluids Analysis Workshop.