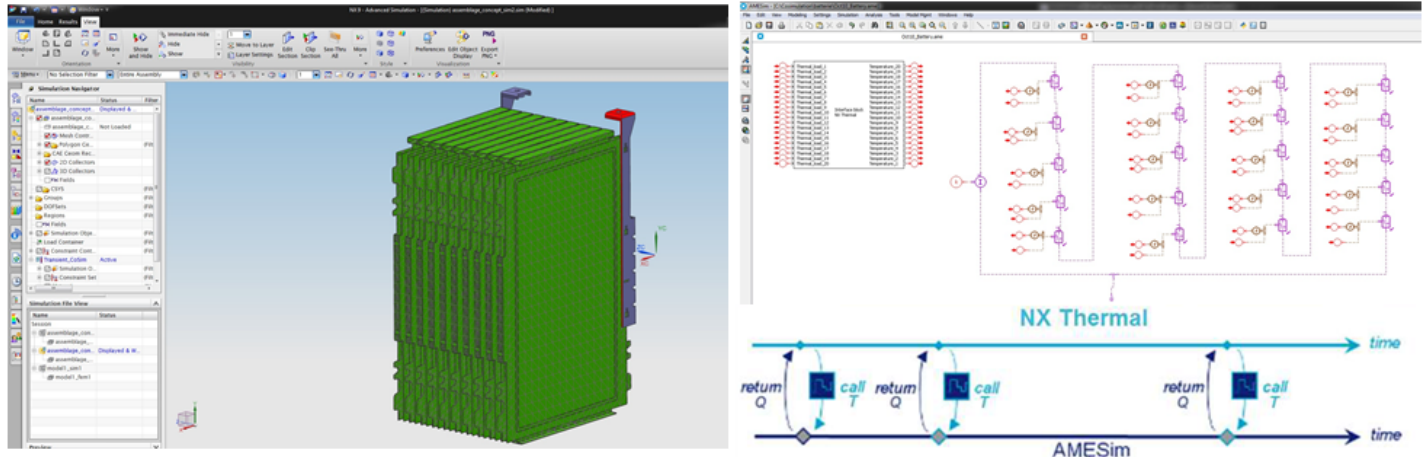


Co-Simulation applied to Li-Ion batteries

ITAQ offers the know-how and expertise of its highly qualified multidisciplinary team which combines a vast experience in the advanced transportation field with specialized skills in developing technological solutions such as: designing electrical, mechanical and mechatronic systems, prototyping, instrumentation, controls, certification and testing.



Business Challenges

- Establish communication between AMESim and NX Advanced Simulation
- Complete battery model from scratch and measure the heat load
- Scale-down the battery cooling system leading to decrease of production cost.

Solution/Services

Modeling the Li-Ion battery cells with a 1D model using LMS Amesim and couple it with a 3D thermal model in NX Advanced Thermal.

Results/Benefits

Simulation with NX Thermal and AMESim enables elimination of time-consuming laboratory measurements. Simulation with both tools enables the analysis of physical phenomena like electrical unbalance up-front through simulation. NX Thermal captures 3D effects, where spatial distributions of temperature are key. AMESim brings electrochemistry modeling capability to complement temperature predictions from NX Thermal. Seamless co-simulation enables leveraging the strengths of both tools.

Project Highlights

- Ability to build a coupled simulation with NX Advanced Thermal and AMESim
- Increased precision of the simulation while reducing the amount of lab testing before entering the design phase of the battery pack
- Coupled simulation delivers additional information that would otherwise require the actual fabrication and testing of the pack

Quote

“Using Nx Thermal and AMESim simulation software reduced the number of physical tests needed to complete the design of our battery thermal management system. The validation with our testing equipment showed excellent correlation between the models and the results.”

Pierre-Luc Lapointe ing. Jr., ITAQ