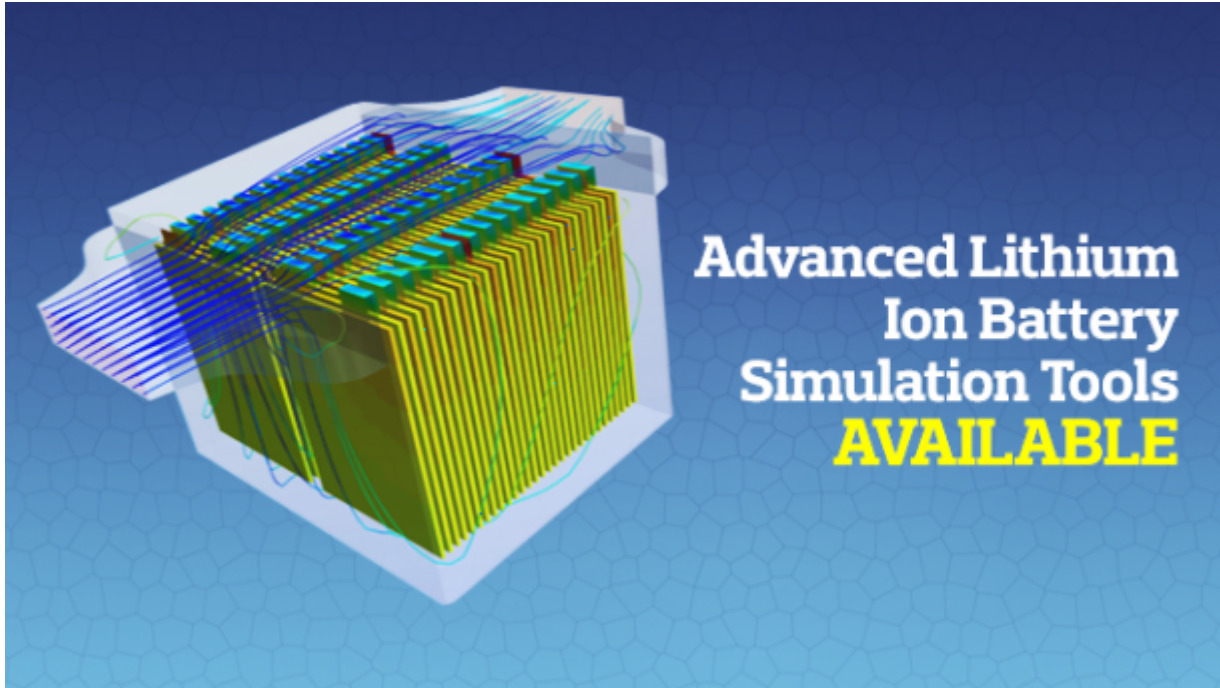




Published on *CD-adapco* (<http://www.cd-adapco.com>)

[Home](#) > Advanced Lithium-Ion Battery Simulation Tools Available

Advanced Lithium-Ion Battery Simulation Tools Available



Computer software accelerates design of next generation advanced automotive batteries

New York and London. July 28, 2014

CD-adapco today announced the successful completion of its development project targeting the automotive and lithium ion battery industries, enabling faster design and development of advanced electric drive vehicle power systems. This project, which began in August 2011, is co-funded by the Vehicle Technologies Office in the U.S. Department of Energy (DOE) and managed by DOE's National Renewable Energy Laboratory (NREL). This project is part of the competitive Computer Aided Engineering of electric drive Batteries (CAEBAT) activity launched by DOE in 2010. The initial award of the project was reported on July 7th, 2011 and the project team included CD-adapco, Battery Design Inc, Johnson Controls Inc and A123.

The methods developed within this program are now available within CD-adapco's flagship product STAR-CCM+ and also in the application specific tool, Battery Design Studio. These solutions provide seamless integration between electrochemists and thermal engineers within the battery design process. Through linking the flow, thermal and electrochemical simulations into one environment, a highly accurate solution can be obtained. The models also span multiple computational domains from systems models to highly resolved complex 3D models. The image below shows an example of both the thermal and electrochemical results produced for a 12-cell module.

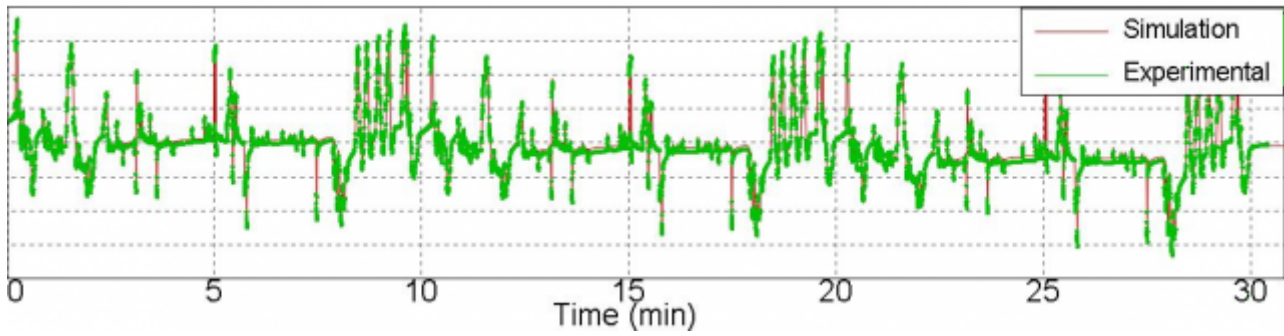


Figure 1 Predicted cell voltage during an automotive drive cycle (scale removed)

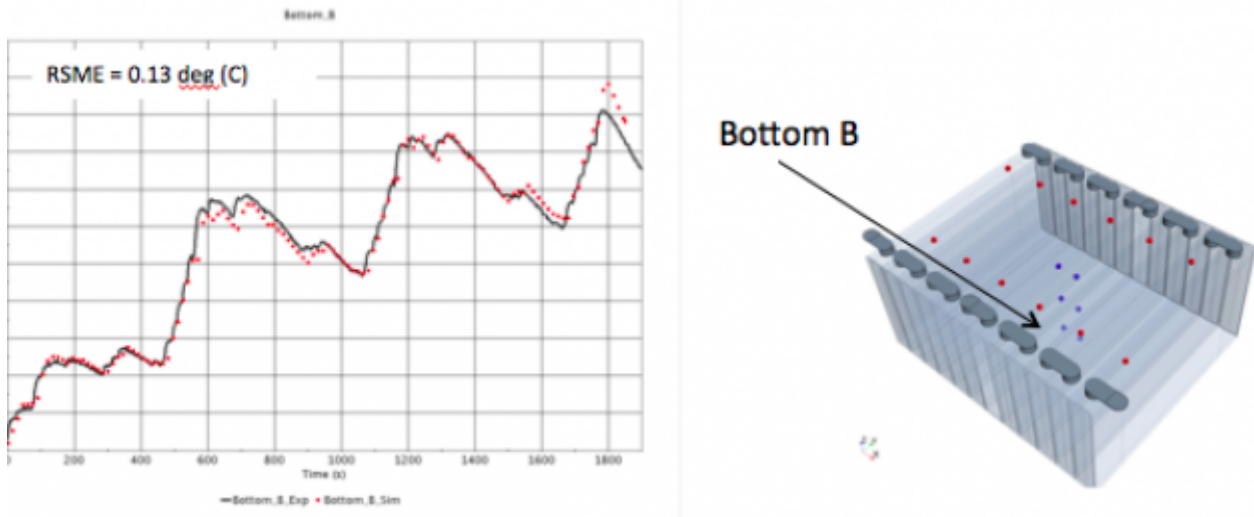


Figure 2 Predicted cell temperature during an automotive drive cycle. Left: Plot of temperature on the surface of a cell within the simulated module compared to an experimental measurement. Right: Position of the temperature sensors in the tested module.

Johnson Control's Director of Controls & Modelling Brian Sisk commented "We are pleased to have worked with our partners on the Department of Energy's CAEBAT project. CAEBAT

has provided us with world-class capabilities to model the performance and safety of Lithium-ion batteries. These technologies have helped us design innovative battery systems and enable new fuel-saving technologies for vehicles."

Ahmad Pesaran, Energy Storage Group Manager in NREL's Transportation and Hydrogen Systems Center, added "Continued progress developing and linking physics based models of batteries allows developers and designers to better understand the internal behavior of batteries in electric drive vehicles and explore new designs in a virtual environment, reducing the number of prototypes and tests required by a traditional build-break design cycle. The outcome of this project is expected to enable scientists and engineers to further improve the performance, cost, and lifetime of advanced lithium ion batteries in support of the DOE's EV Everywhere Grand Challenge."

"We are pleased that our battery simulation tools in STAR-CCM+, developed under the DOE CAEBAT activity, is already being used by a significant number of companies and universities to design battery packs faster," indicated Steve Hartridge, Director of Electric & Hybrid Vehicles at CD-adapco.

For information on the CAEBAT activity and its objectives, please visit:

<http://www.nrel.gov/vehiclesandfuels/energystorage/caebat.html> [1]

For more information on the created methods and to obtain a trial license contact your local CD-adapco office at www.cd-adapco.com/locations [2].

About CD-adapco

CD-adapco (<http://www.cd-adapco.com> [3]) is the world's largest privately held CFD focused CAE provider. Our core products are the technology-leading simulation packages, STAR-CCM+ and STAR-CD. The scope of our activities, however, extends well beyond CFD software development to encompass a wide range of CAE engineering services in fluid dynamics, heat transfer and structural engineering. Our ongoing mission is to "inspire innovation and reduce costs through the application of engineering simulation software and services."

A privately owned company, CD-adapco has maintained 17% organic year-on-year growth over the last 5 years. CD-adapco employs 850 talented individuals, working at 30 different offices across the globe.

Press Contact

Lauren Gautier, CD-adapco

lauren.gautier@cd-adapco.com [4]

+1 248-277-4600

CD-adapco is the world's largest independent CFD focused provider of engineering simulation software, support and services. We have over 30 years of experience in delivering industrial strength engineering simulation.

Source URL: <http://www.cd-adapco.com/pr/advanced-lithium-ion-battery-simulation-tools-available>

Links:

- [1] <http://www.nrel.gov/vehiclesandfuels/energystorage/caebal.html>
- [2] <http://www.cd-adapco.com/locations>
- [3] <http://www.cd-adapco.com>
- [4] <mailto:lauren.gautier@cd-adapco.com>