

Modeling of Li-ion Cell Performance

Modeling of Li-ion Cell Performance (BattQual™)



Accelerated Qualification of New Li-ion Cells

Connects Technology To Business...

New Lithium-ion battery cells are being created each year. Each new cell incorporates different chemistry, design, and manufacturing technologies. Qualifying these new cells intended for space applications can take up to seven years or more and cost millions of dollars.



Precision Tracking Space System (PTSS)

Through physics-based modeling of Li-ion cells, one can understand the key relationships between accelerated cell testing methods (e.g. temperature, discharge rates, etc.) and cell degradation mechanisms (e.g. SEI layer, etc.) This knowledge will reduce the time required to qualify new cells, reduce the expense of cycle testing, improve cell reliability, and lower the costs of batteries for space applications.

What can BattQual™ do?

- Predict new Li-ion cell performance
- Accelerate qualification of new cell designs by a factor of 4.

What is BattQual?

- Physics-based modeling of multiple cell degradation mechanisms
- Qualification process incorporating accelerated testing by temperature, discharge rates, etc.

BattQual™

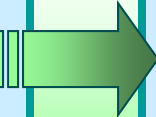
Physics-based Modeling Benefits

- Accelerated Qualification
- Reduced Qualification Costs
- Accurate Cell Performance Prediction
 - Capacity Fade
 - Power Fade
 - End of Discharge Voltage
 - Etc.
- Reusable Models for Different Cell Chemistries and Designs

Accelerated Testing Procedures

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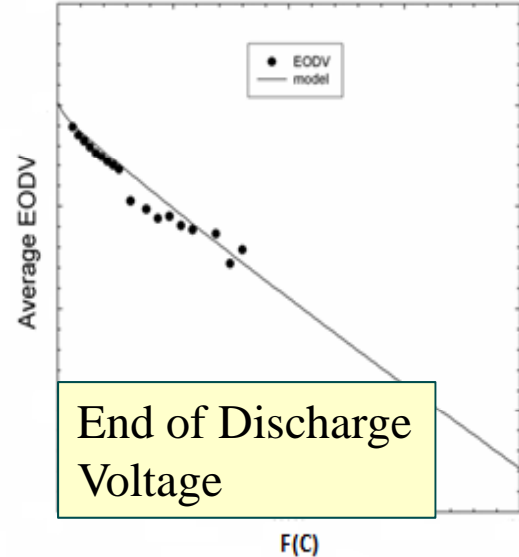
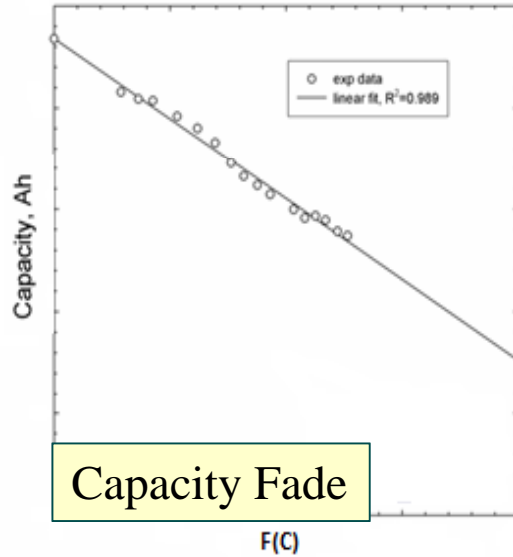
Physics-Based Models



Fast Cell Qualification

Physics-based Modeling

The BattQual solution provides an integrated physics-based model incorporating different Li-ion cell degradation mechanisms and a process using this model to perform accelerated qualification of new cell designs and chemistries.



Applications

GTC's has a rich history of developing battery modeling and monitoring solutions for different applications such as soldier power, aircraft batteries, data centers, and unmanned ground vehicles. In addition to these applications, BattQual can be used to quickly qualify new battery cells for Satellites (PTSS), Weapon systems (SM3 IIB), UAV, Submarines, Hybrid Electric Vehicles, Mobile Power, Electric Grid, and much more.



SM3 IIB Interceptor



Hybrid Electric



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