Software Title

KEY FEATURES

1. Fast and robust framework
2. Three types of built-in models:
   - Doyle-Fuller-Newman model (DFN/ P2D)
   - Single particle model (SPM)
   - Single particle model with electrolyte (SPMe)
3. Database of standard cell chemistries
4. Simulate experimental tests such as GITT, HPCC, EIS, etc.
5. Extract parameters for equivalent circuit model (ECM)
6. Seamless integration with other python libraries
7. User friendly GUI and data visualization

THE CHALLENGE

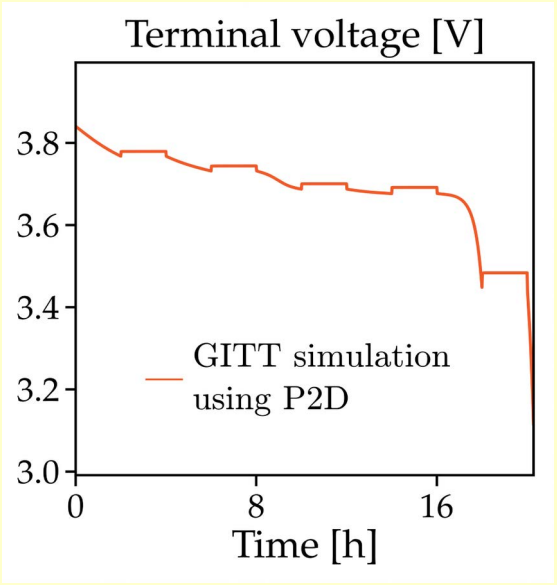
The physics-based electrochemical models provide the backbone for optimizing the cell design and cell performance. These models solve coupled partial differential equations in the continuum scale for the evolution of temperature and ion concentration. However, due to the varying length scales and multiple physics, these coupled partial differential equations are highly non-linear and often time consuming to solve.

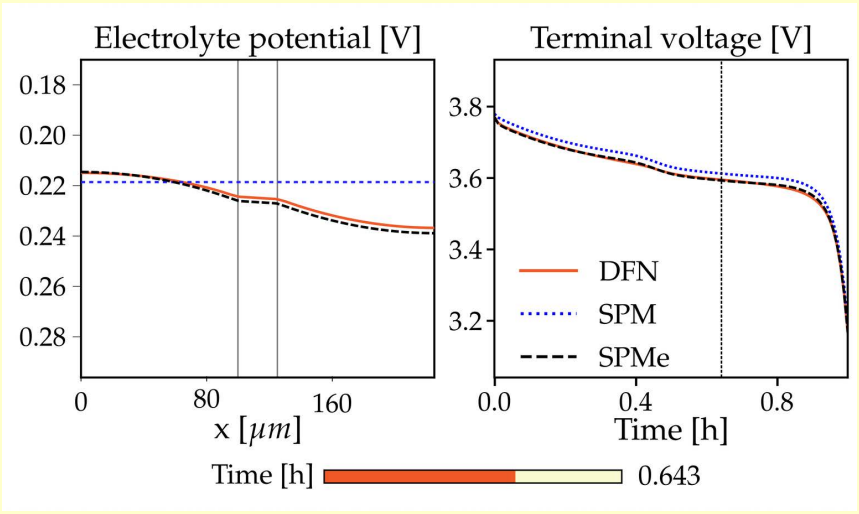
Newsletter Title

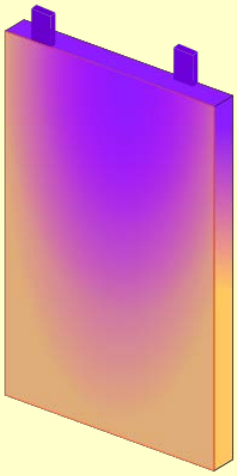
THE SOLUTION

Electrochemical model

Our electrochemical model is based on the industry standard Doyle-Fuller-Newman model, also known as porous 2-d (P2D) model. It is based on python libraries and exploits the state-of-the-art automatic differentiation and solvers from scipy and numpy. Due to its modular design, additional physics can be easily integrated such as modified solid-state diffusion, 3D effects, SEI formation, etc. Additionally, our easy-to-use graphical user interface (GUI) enables non expert users and project managers to quickly run a simulation for demonstration as well as testing. This facilitates steeper learning curve for a new user and greater adaption of new physics in battery simulation.







GUI

- Interactive graphical user interface (GUI)
- Easy access to model parameters
- On the fly customization of plots (color, font, etc.)
- Feature transformation(log, dy/dx, average, etc.)
- Modular nature of GUI allows plotting any dataset with x and y
- Export plots as PNG, TIF, JPG, PDF, SVG, or CSV format.

Cost saving in cell optimization

User friendly GUI

Customer support for development

Faster simulation using python libraries

ABEE
AVESTA BATTERY & ENERGY ENGINEERING

Ransbeekstraat 310, 1120 Brussels, Belgium

+32 486 95 48 90

contact@abeegroup.com