


# FOBSS: Monitoring Data from a Modular Battery System

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Efficient energy storage is crucial in future energy systems. The management of lithium-ion based batteries is a challenging topic of research in this area. To improve management systems, monitoring data is indispensable, be it for single battery cells, be it for systems of multiple cells --- the topic of this article.

 <https://dl.acm.org/doi/abs/10.1145/3307772.3331020>



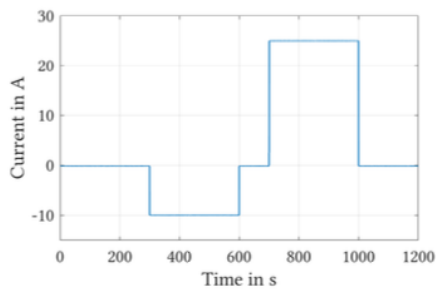
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## Key takeaways

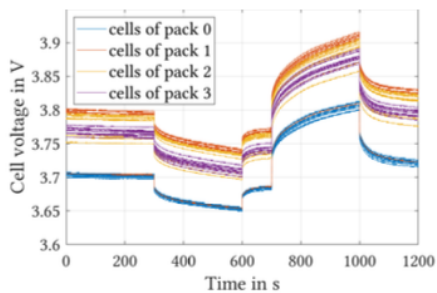
- temperature, current, voltage → State of Charge, State of Health
- FOBSS: Frequent Observations from a Battery System with Subunits
  - multiple battery packs each monitored by a subunit of the BMS
  - each battery pack contains several battery cells
- functionality
  - **inverter** → used to charge and discharge the battery
    - + current: battery is charged
    - - current: battery is discharged
    - Volt: [0 V, 500 V]
    - current: [-90 A, 90 A]
    - max power: 15kW
  - **BMS: Battery Management System** → monitors the battery
    - BMS-master: two sensors measuring overall **voltage** and **current**
    - BMS-slave: **temperature** and **voltage** of each cell
    - + current: battery is discharged
    - - current: battery is charged
  - **battery**
    - 4 packs each with 100 cells
    - voltage of a pack: 39,6 V
    - capacity of a pack: 40 Ah
    - cells within a pack and packs within are connected in series
- dataset
  - **profiles**: several charge, discharge and rest steps
    - described in profiles.xlsx

- **battery** (every 0.25 sec)
  - voltage
  - current
- **inverter** (every 0.1 sec)
  - voltage
  - current
- **cells**
  - 4 x temperature (every 1.5 sec)
  - 4 x voltage (every 0.25 sec)
- matlab script is provided

## Example plots



(a) Current from inverter



(b) Voltage response of each battery cell

