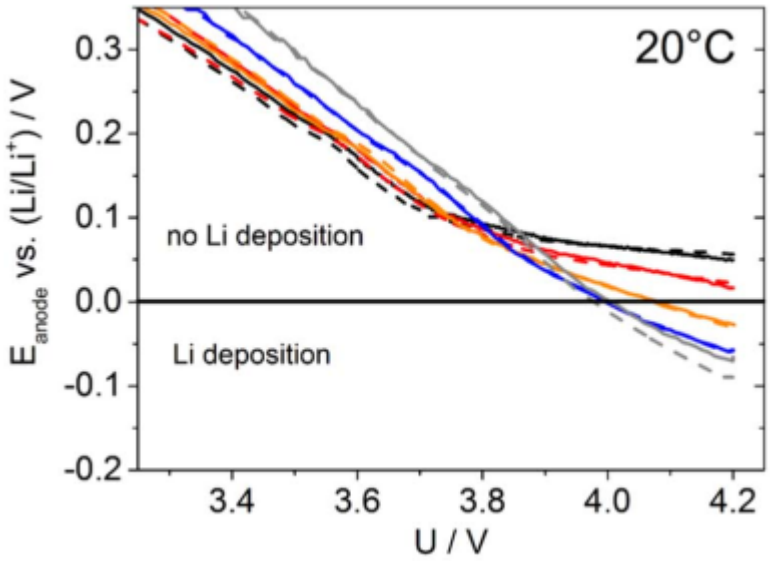
T05 Operando electrochemical assessment of electrodes

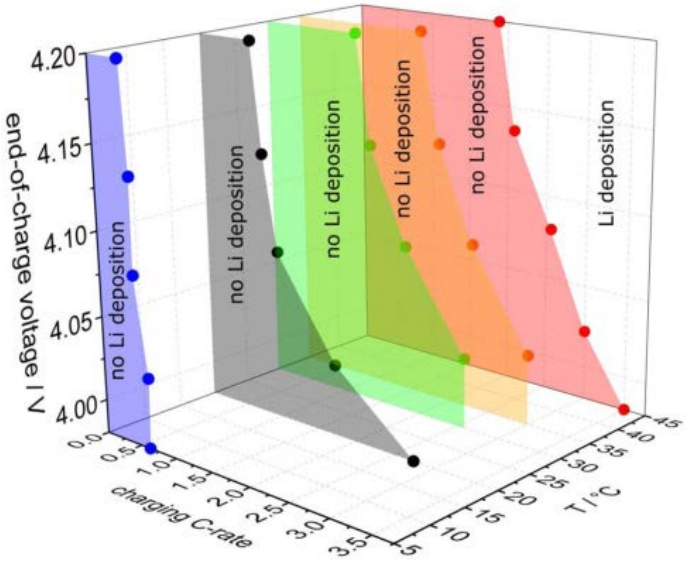
Principle

- Operando measurement of anode potential vs. Li/Li^+ in Li-ion full cells
- Determination of charging conditions to avoid the aging mechanism of Li plating

Example for energy storage application

Finding favorable operating conditions for Li-ion cells:
Temperature, end-of-charge voltage, fast-charging procedures

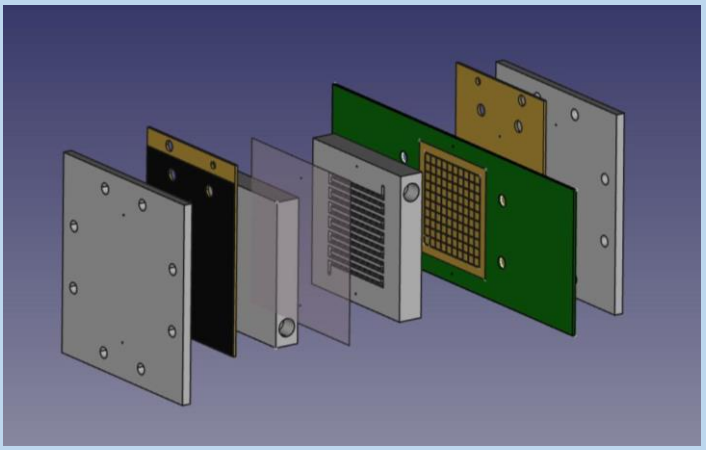




T. Waldmann et al., Journal Electrochem. Soc. 163 (**2016**) A1232.

T5: Operando electrochemical assesment of electrodes

- ✓ In plane, two dimensional distributed current measurement in metal-air and redox flow batteries
- ✓ Evaluation of materials evolution as a function of current distribution and local EIS



Systems analyzed

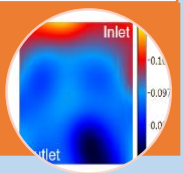
- **Redox Flow Batteries**
- **Metal-Air Batteries**

General features

- *Test samples:*
  - electrodes,
  - membranes
  - bipolar plates
- Time-scale: ~2/4 weeks

- In situ diagnostics
- Electrode performance at local scale
- Effect of current distribution in battery materials

Current distribution



- Understanding of components performance
- Identification of causes of failure (e.g. ohmic drop and mass transport)

Local EIS