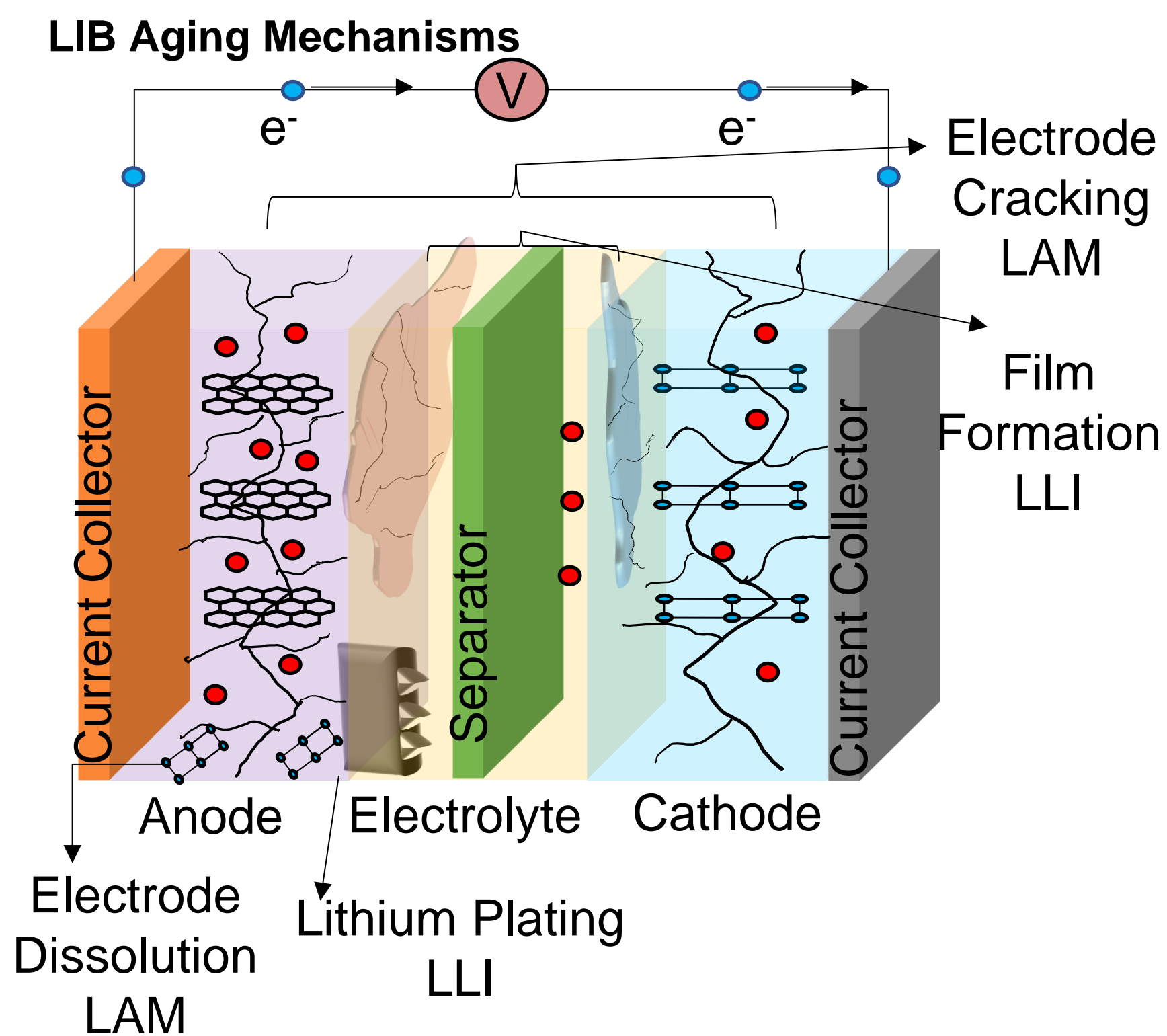


A Multi-Metric, Spatially-Dependent Aging Model for Lithium-Ion Batteries

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Introduction and Objective

- Lithium-ion battery (LIB) aging consumes capacity through loss of Lithium ions (LLI) or loss of active material (LAM)

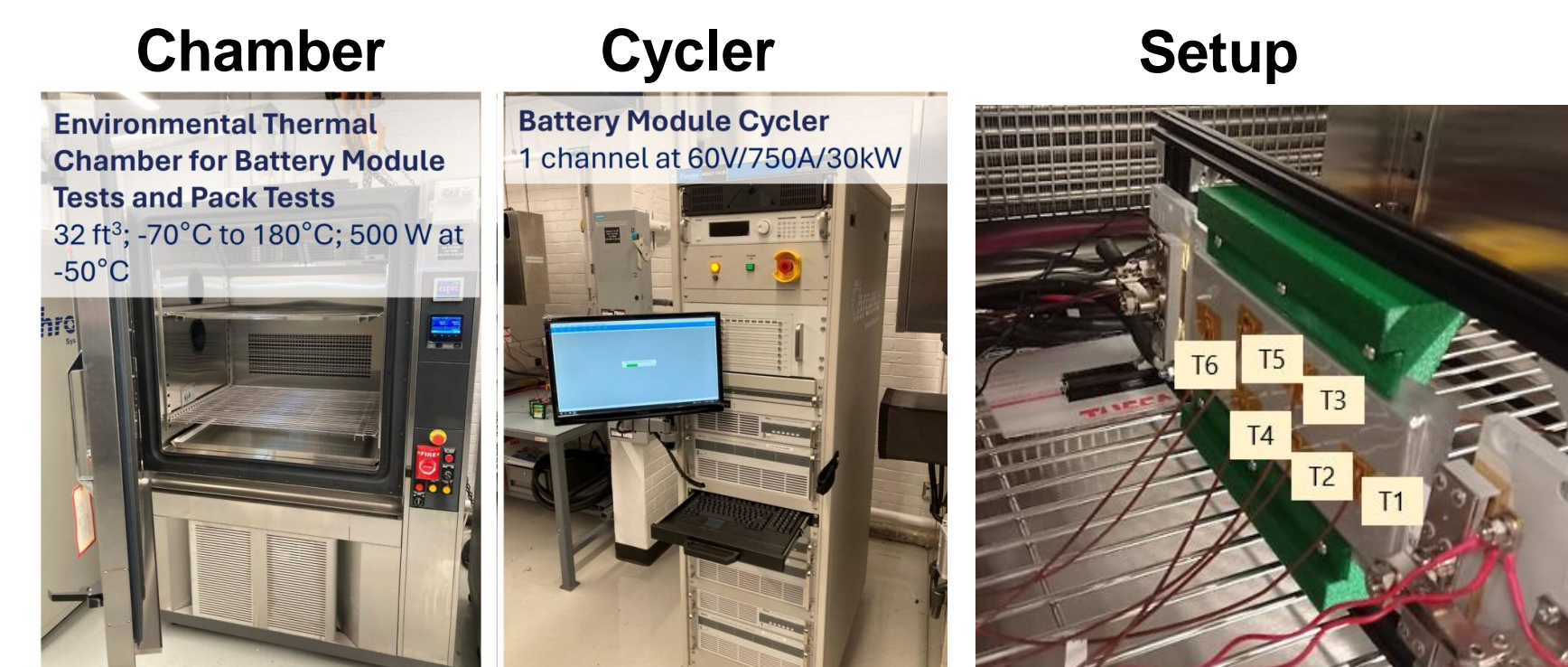


Objective:

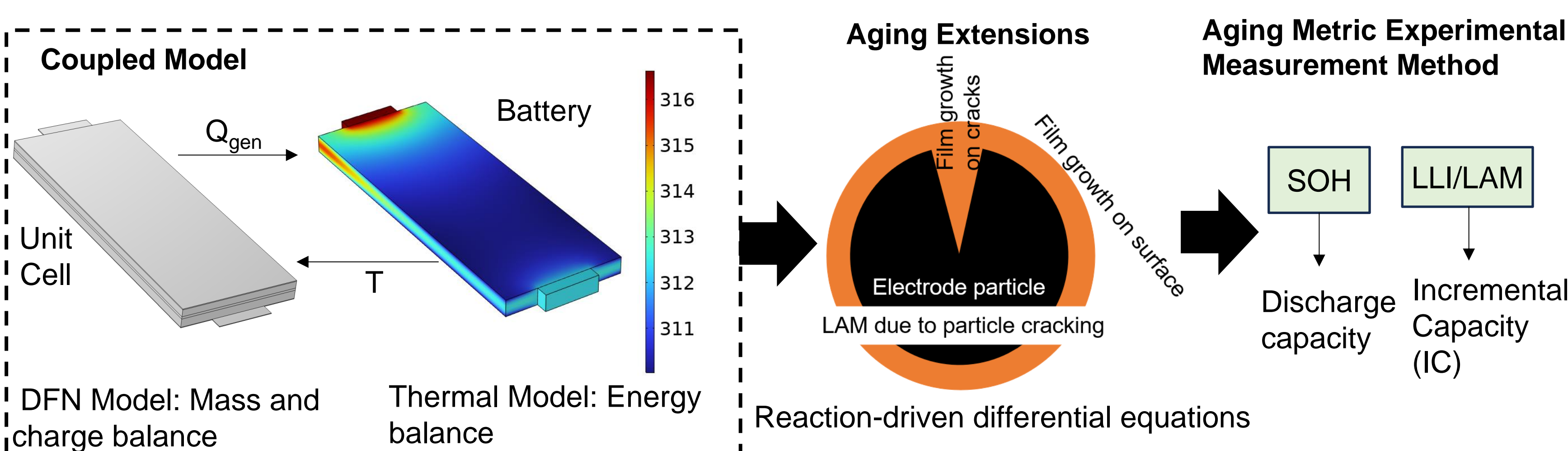
- Develop and validate an aging model capable of capturing spatial aging variation, state of health (SOH), LLI and LAM

Experimental Methods

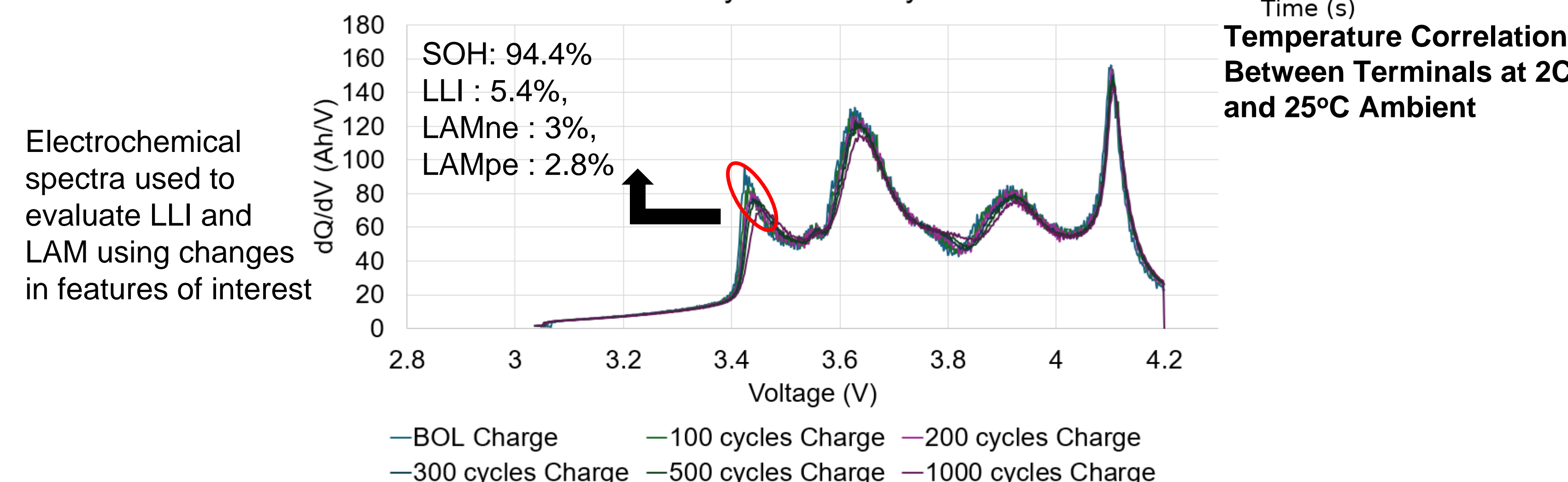
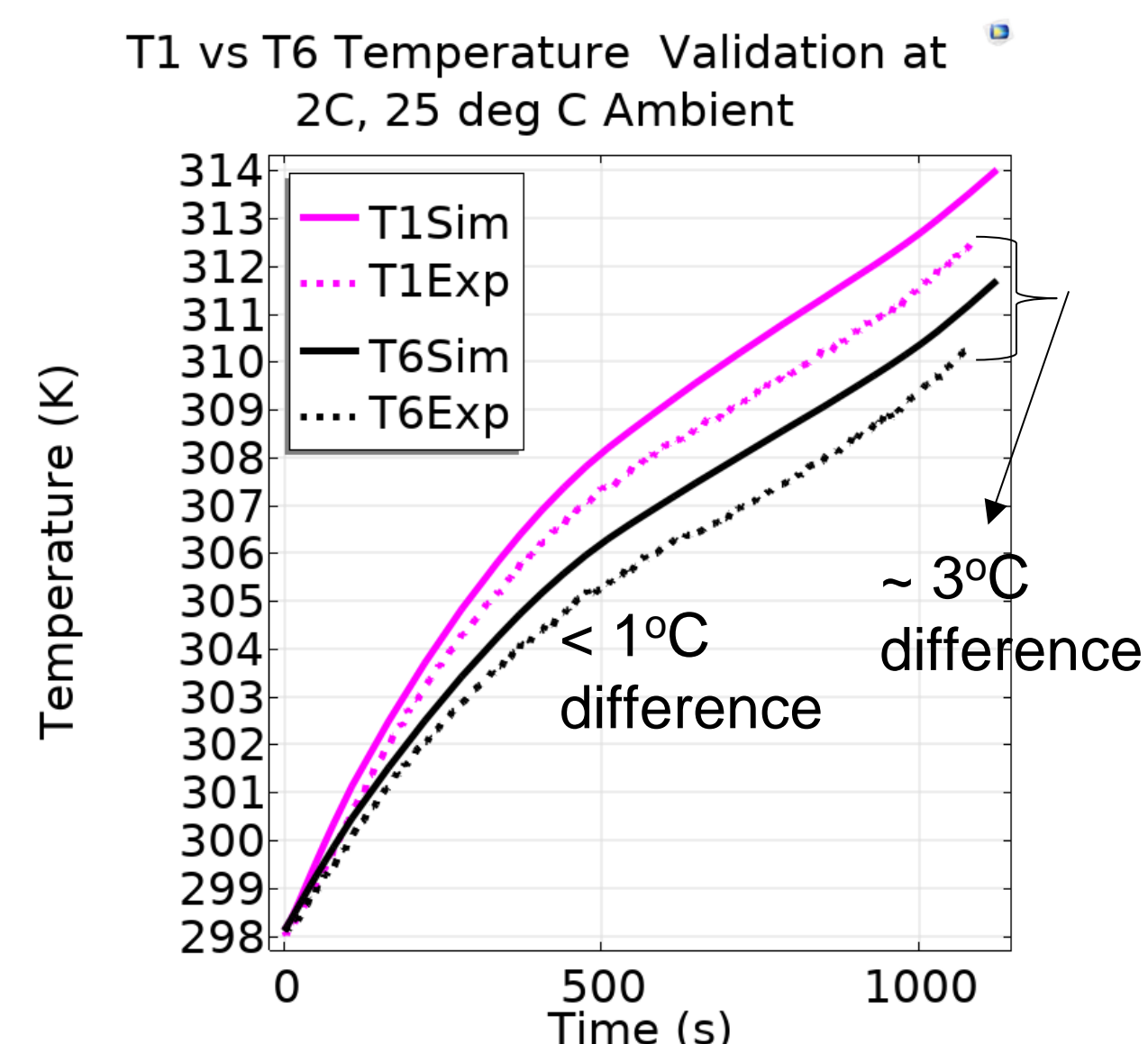
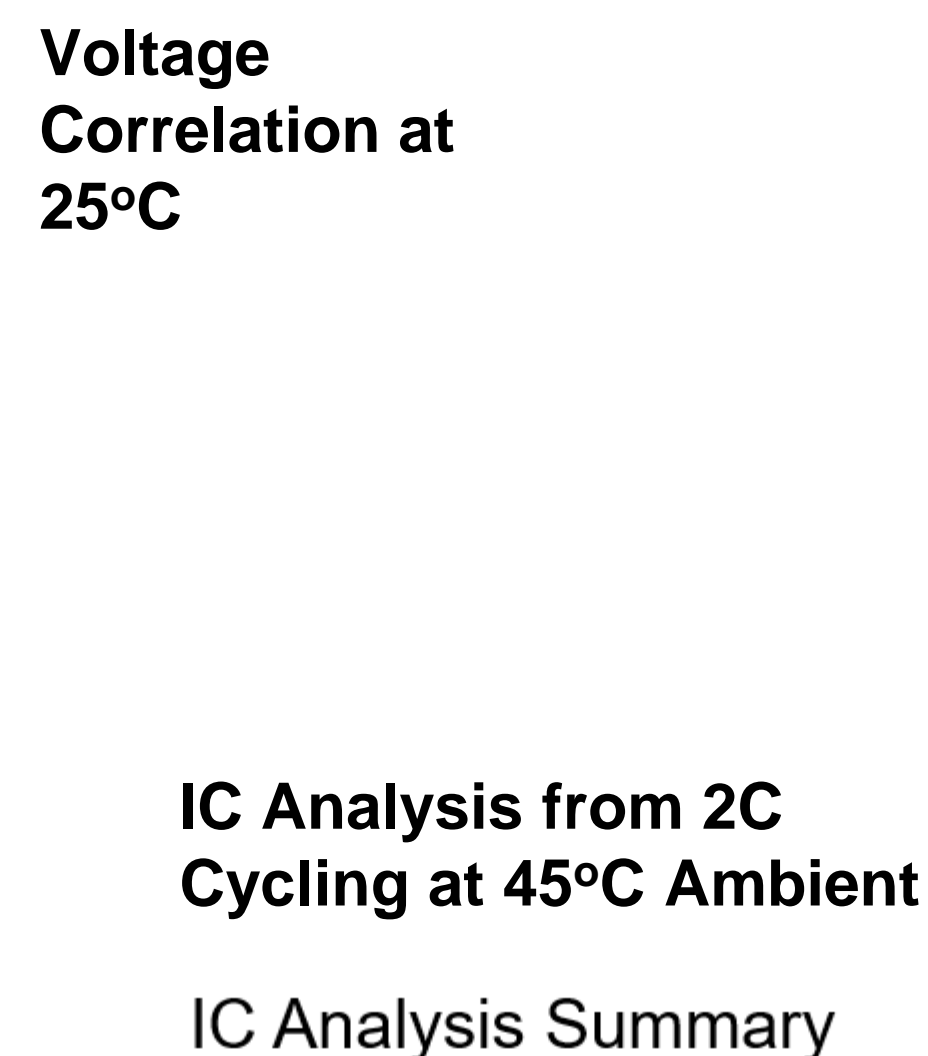
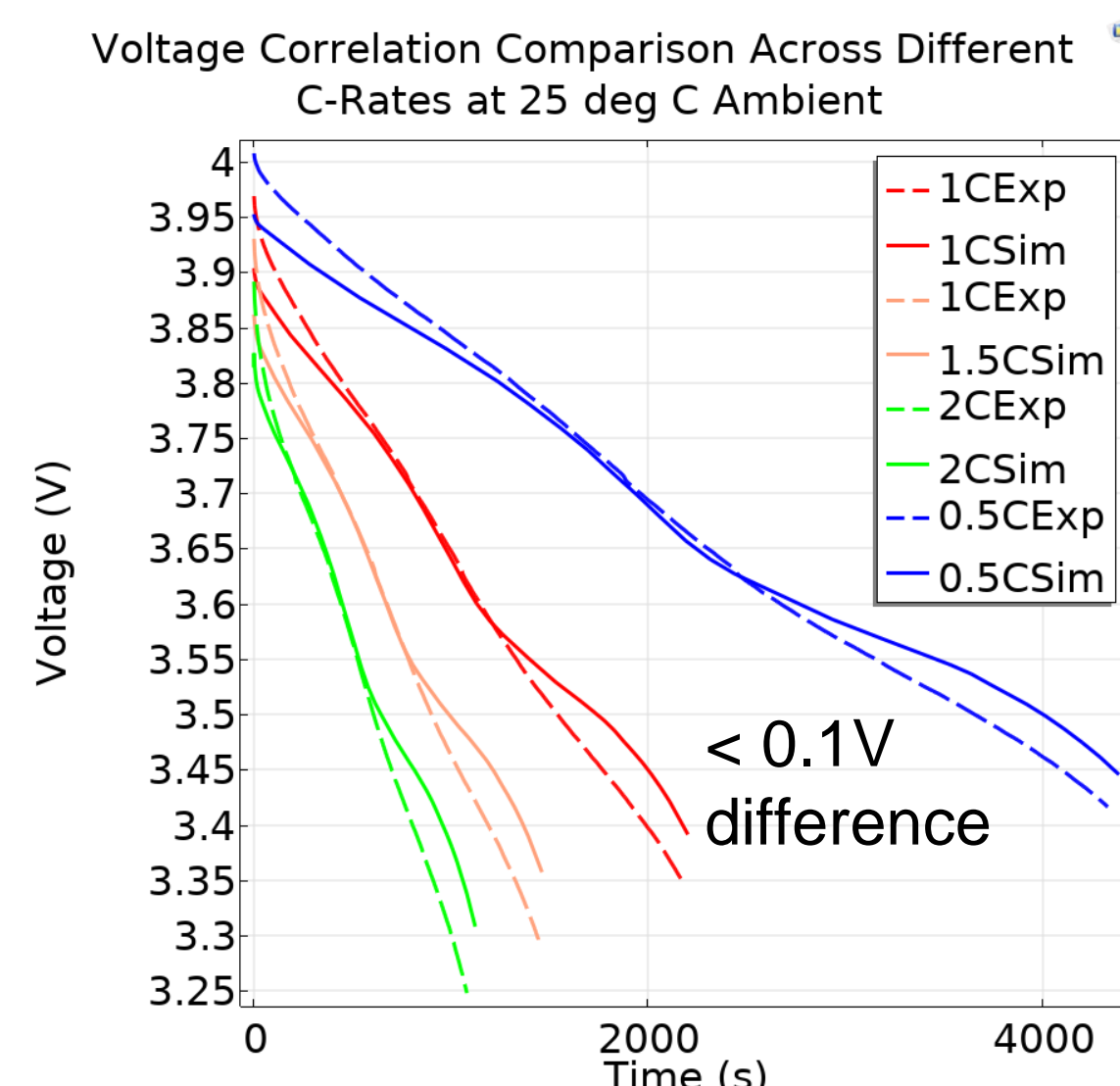
- Cell discharge tests for characterization and cycling tests for aging in a 61 Ah NMC pouch cell



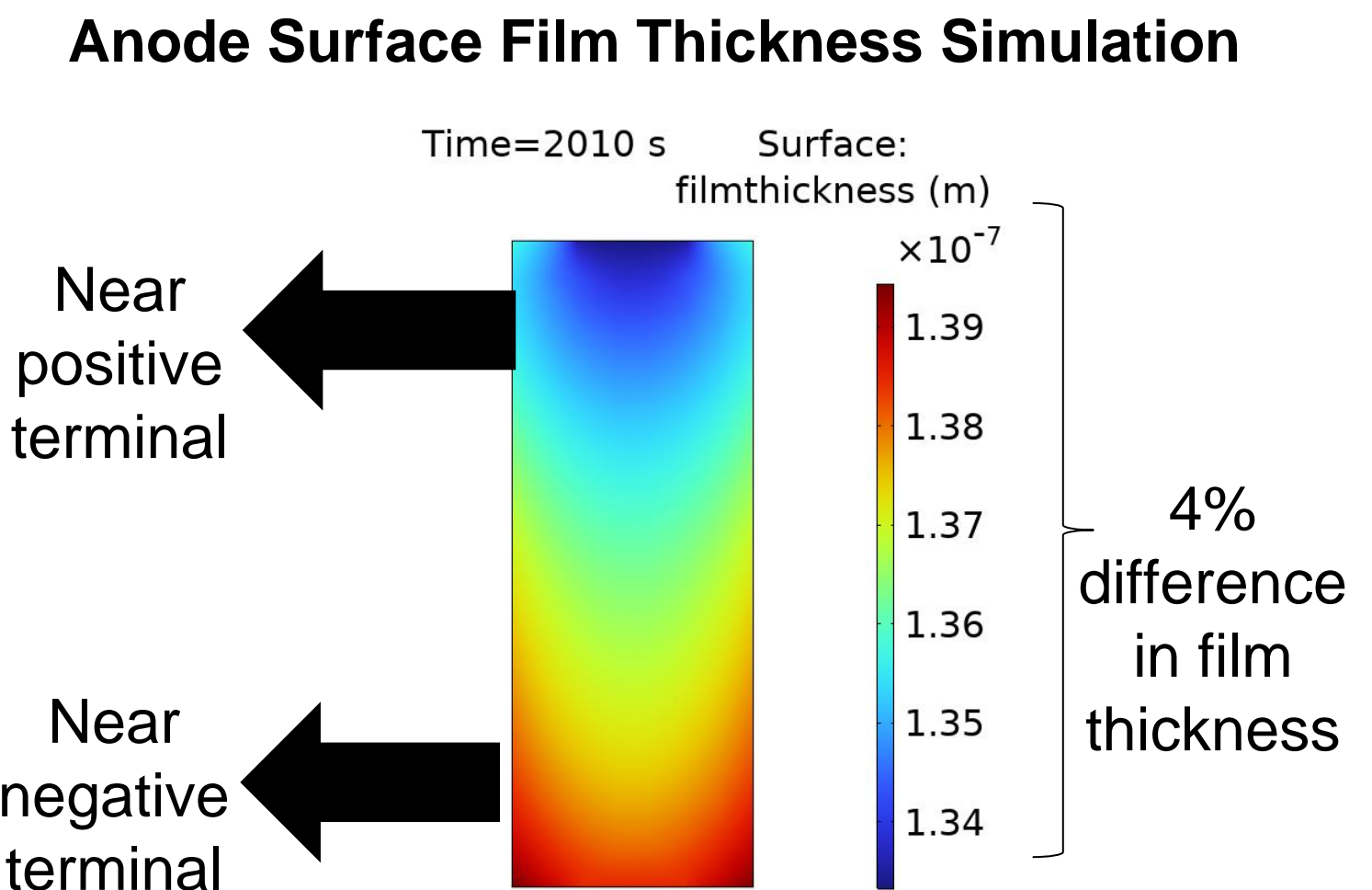
Modelling and Aging Metric Measurement Methods



Coupled Model Simulation and Aging Experimental Preliminary Results



Preliminary Aging Simulation



Conclusion

- Large format pouch cells can show a 3°C temperature difference between the positive and negative terminals
- Coupled model shows excellent voltage correlation across C-rates and spatial temperature correlation across cell surface
- Next step: integrate remaining aging governing equations in coupled model

Acknowledgements

This work was supported by the University of Toronto Electrification Hub, the Natural Sciences and Engineering Research Council of Canada through the TherMET training program, Flex-N-Gate, Mitacs Accelerate program and CMC Microsystems.

