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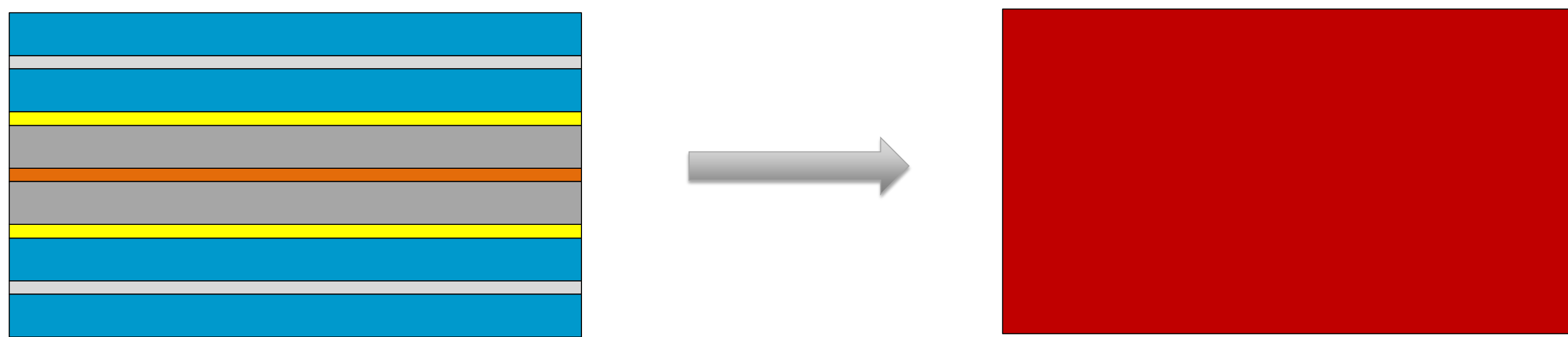
Testing, simulation and evaluation of electro-thermal characteristics on cells and modules to first optimize and then validate GREENLION module design.

Testing and Modelling to Support Cell and Module Design

Battery Cell - Thermal Test, Simulation and Validation

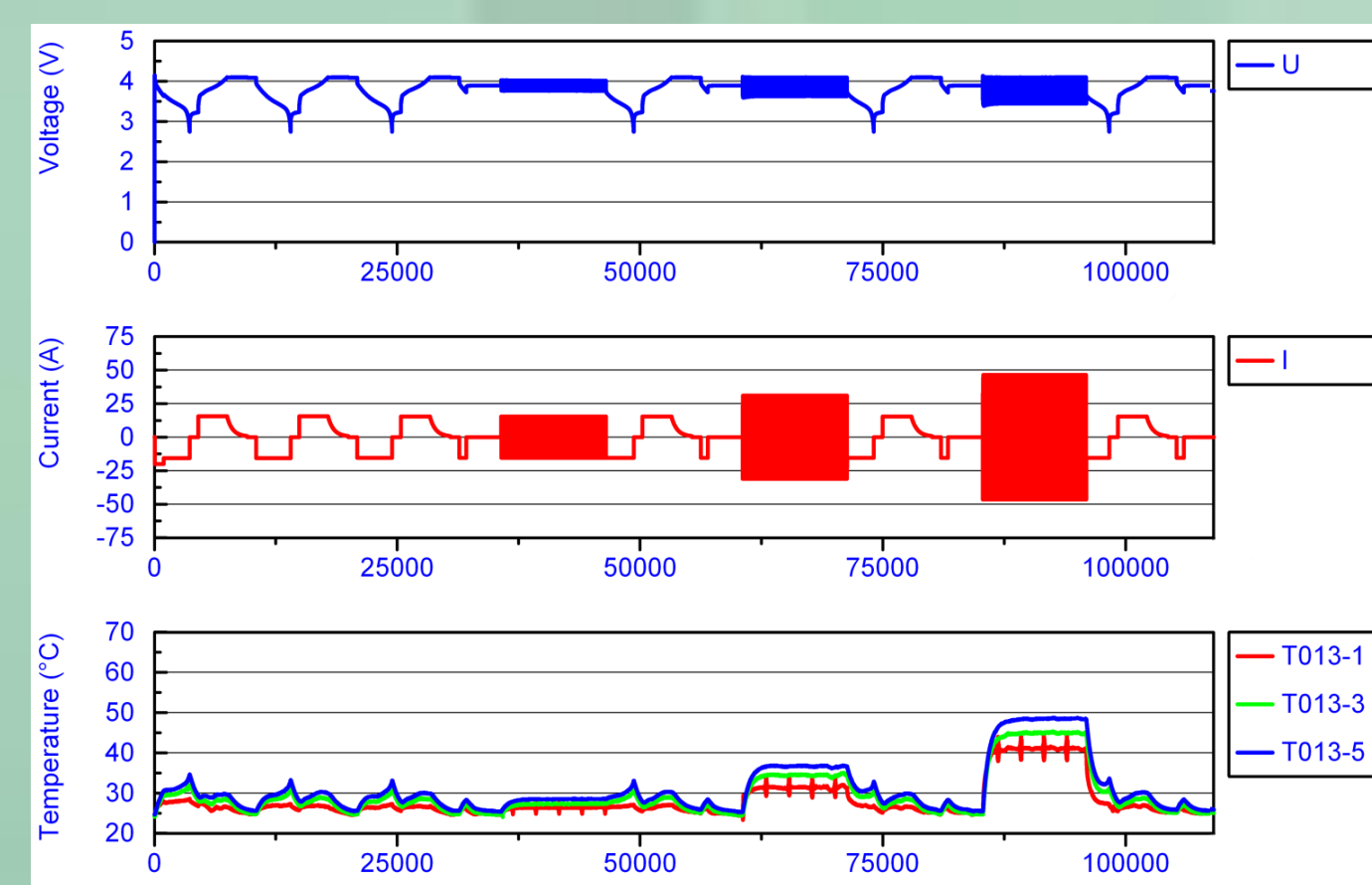
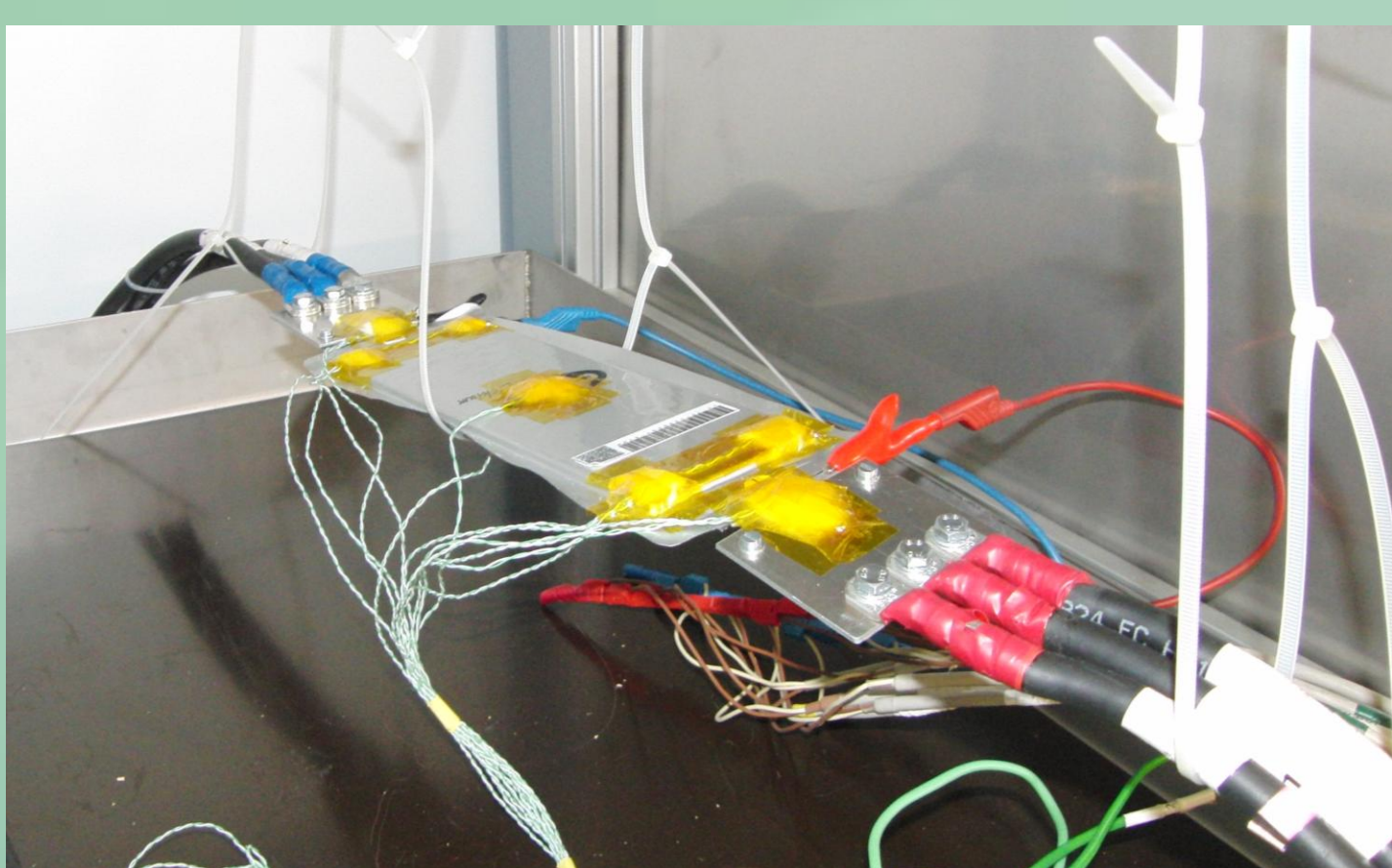
Simplification of active battery material layered arrangement:

Layered structure of pouch cell → homogeneous, anisotropic material



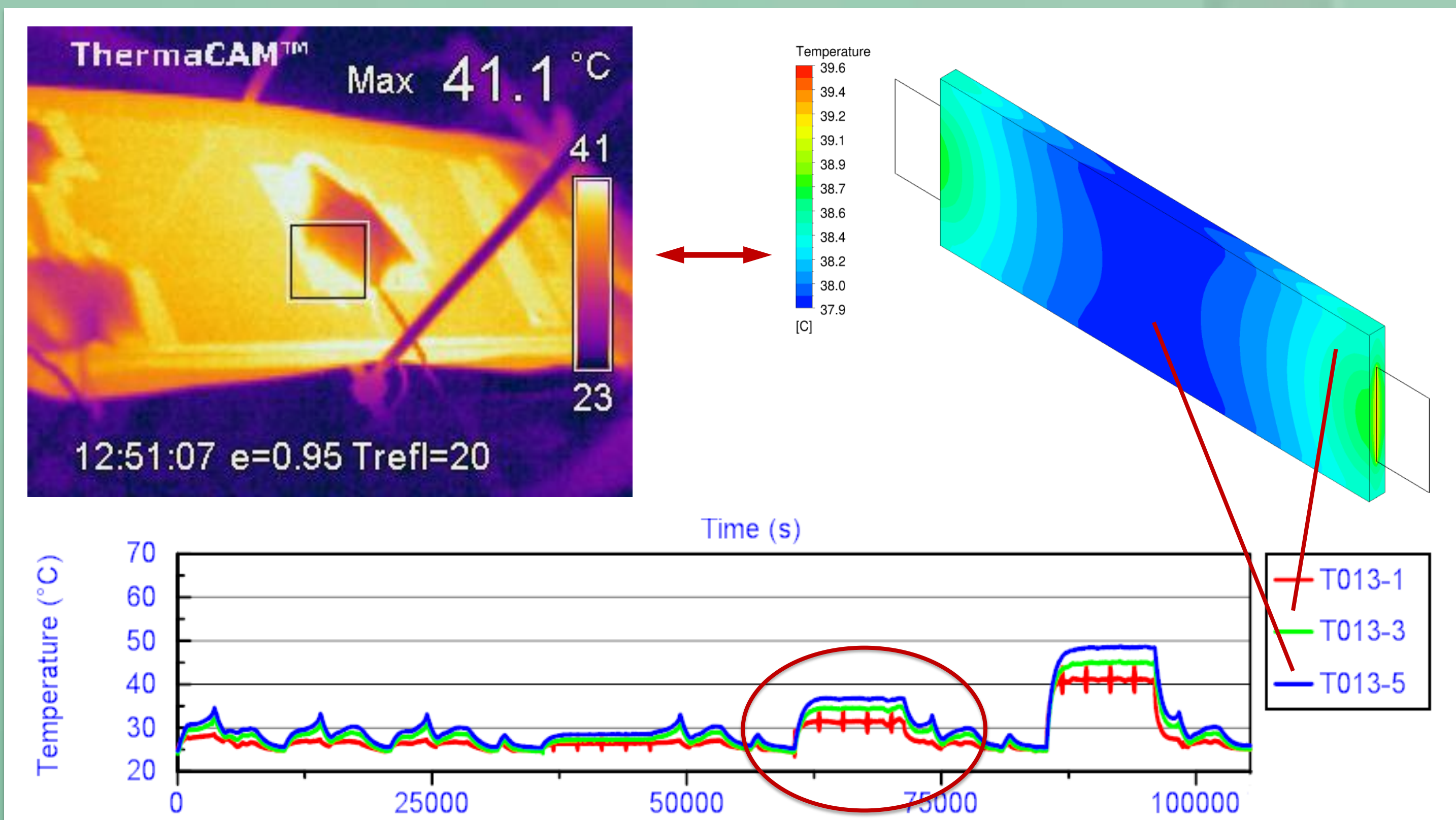
Test setup horizontal, free convection

10s charge/discharge pulse for quasi-stationary cond.



Test setup horizontal, free convection

Input current signal and response



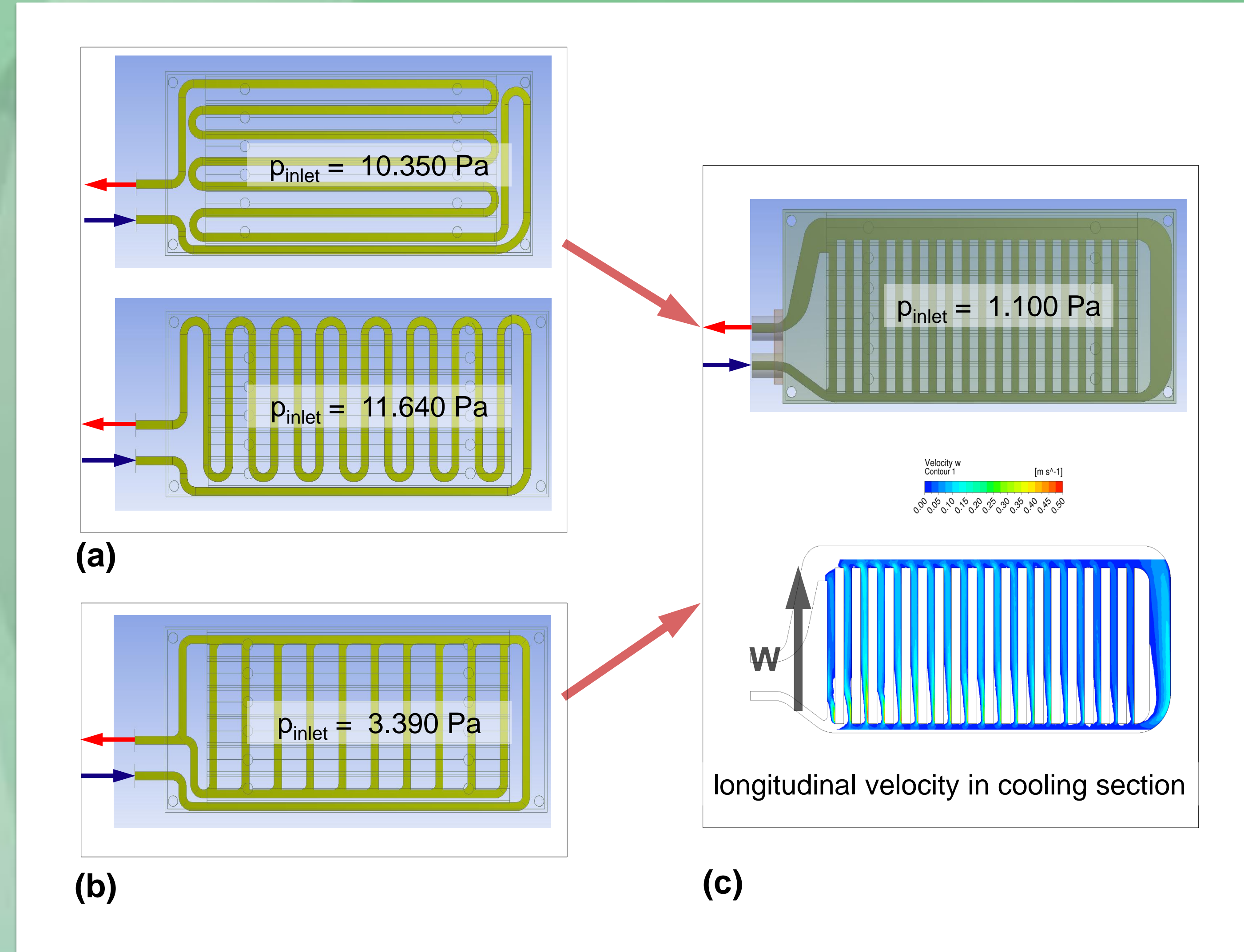
Results and validation

Differences by simplified boundary conditions → Increase accuracy by reduction of simplifications

Test with different positions and forced convection → More robust boundary conditions

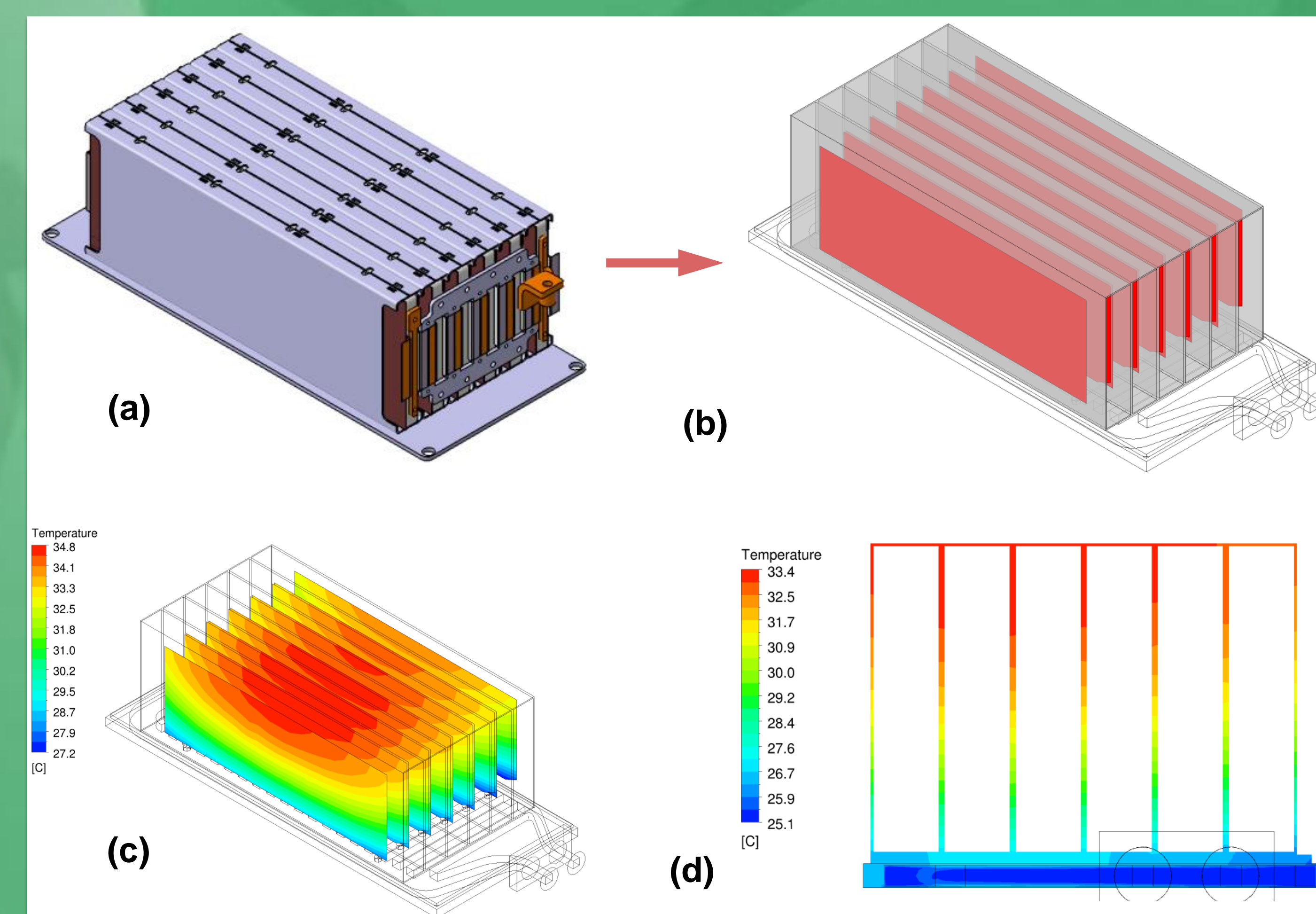
Battery Module - Flow Simulation of Cooling Plate

Validation of different designs of coil arrangement and coil design inside of cooling plate:



Single coil (a), divided parallel coils (b) and optimized design (c)

Battery Module - Thermal Simulation



Real (a) and simplified (b) module; initial results (c) and (d)

Acknowledgements

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