

POETS1-R-EVCharging_DL

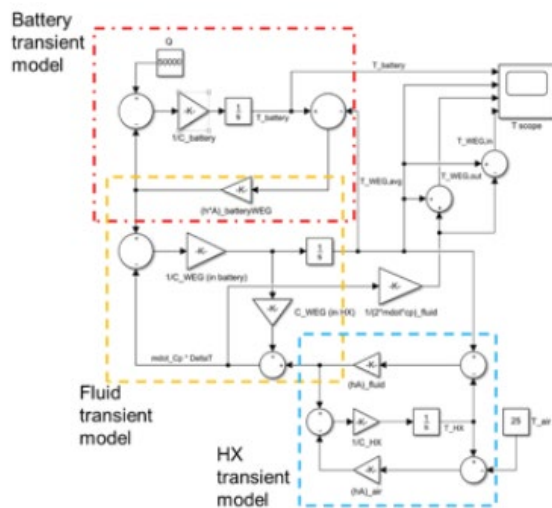
Alternative Systems for Fast Charging Electric Vehicles

Outcome/accomplishment: Scientists explored different battery geometries to reduce and manage the heat generated during fast charging of electric vehicles, in research sponsored by the Center for Power Optimization of Electro-Thermal System, an NSF-funded Engineering Research Center (ERC) based at the University of Illinois.

Impact/benefits: Insights from the research can help with the design of new battery structures and arrangements that can reduce or utilize heat produced during fast charging. To conduct the research, scientists developed tools that can predict the performance of cooling systems and that can simulate the temperature changes in batteries and associated systems during charging sessions.

Explanation/background: To compete more effectively with petroleum-based vehicles, which contribute more greenhouse gases and worsen climate change, electric-vehicle battery charging needs to be reduced to the range of 5-10 minutes instead of current systems that can require an hour to recharge a battery. But such fast charging generates heat that shortens battery life.

In their research, scientists designed new arrangements of batteries in packs that reduce the heat generated in charging. They also looked at how batteries absorb heat, and the tools they developed for measuring and simulating heat in battery cells and packs will help with future battery design.



POETS scientists developed models for simulating and measuring the heat generated in different arrangements of batteries and battery packs. (Credit: POETS)