

STRETCHING BATTERY UTILIZATION USING NOVEL STRESS/STRAIN MODELS & MEASUREMENTS

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Maximizing the utilization of lithium-ion batteries relies on accurate prediction of their complex electrochemical, thermal and mechanical behavior. In this presentation, we will highlight key innovations for such a model-predictive battery management system (BMS).

- Improved state of charge (SOC) estimation by augmenting voltage with bulk stress measurements arising from the lithium intercalation while differentiating from thermal expansion.
- Advanced state of health (SOH) estimation associated with capacity fading based on monitoring shifts in voltage and bulk stress.
- Real-time estimation of state of power (SOP) capability enabling aggressive cell utilization at comparable aging.
- Fast and energy conscious warm-up from subzero temperatures.

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