

Balanced Control Strategies for Interconnected Heterogeneous Battery Systems in Smart Grid Applications

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This paper introduces new balanced charge/discharge control strategies that distribute charge or discharge currents properly so that during operations battery pack balancing is continuously maintained. The strategies are targeted for serially interconnected heterogeneous battery systems to be used for power grid support. SOC-based balanced charge/discharge strategies are developed. Their convergence properties are rigorously established, and simulation examples demonstrate their convergence behavior under different charging current profiles. Also, robustness against parameter estimation errors is discussed.