

Estimation of the State of Charge of the Battery Using EFK and Sliding Mode Observer in MATLAB-Arduino/Labview

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Abstract : This paper presents the estimation of the state of charge of the battery using two types of observers. The battery model used is the combination of a voltage source, which is the open circuit battery voltage of a strength corresponding to the connection of resistors and electrolyte and a series of parallel RC circuits representing charge transfer phenomena and diffusion. An adaptive observer applied to this model is proposed, this observer to estimate the battery state of charge of the battery is based on EFK and sliding mode that is known for their robustness and simplicity implementation. The results are validated by simulation under MATLAB/Simulink and implemented in Arduino-LabView.

Keywords : model of the battery, adaptive sliding mode observer, the EFK observer, estimation of state of charge, SOC, implementation in Arduino/LabView

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