

State Estimation of Lithium-Ion-Batteries using Strain Gages

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Abstract

During lithiation and delithiation of a lithium-ion battery (LIB), the anode can undergo a volume change of approximately 10%. This effect can be measured with strain gages. In this work, multiple cylindrical cell types have been equipped with strain gages. The strain of cylindrical cells, measured during charging and discharging cycles, exhibits a strong correlation with the lithiation state, indicated by a coefficient of 0.97. This information can be further utilized for State of Charge (SOC) estimation.