

5 Methods for the estimation of the battery impedance

Group 1

5.1 Methods based on impedance spectroscopy

Active impedance spectroscopy

Passive impedance spectroscopy

Group 2

5.2 Methods based on electrical models

5.2.1 KF-based methods

5.2.2 Least-squares-based recursive estimation

5.2.3 Non-recursive estimation on the basis of least-squares method

5.2.4 Adaptive varied-parameters approach

5.2.5 Other adaptive filters and observers

Group 3

5.3 Methods based on an electrochemical model

Least-squares-based methods

Gradient-based recursive approach

Multi-rate particle filter