Measurement-Based Transmission Line Parameter Estimation with Adaptive Data Selection Scheme - DTU Orbit (06/12/2018)

Measurement-Based Transmission Line Parameter Estimation with Adaptive Data Selection Scheme

Accurate parameters of transmission lines are critical for power system operation and control decision making. Transmission line parameter estimation based on measured data is an effective way to enhance the validity of the parameters. This paper proposes a multi-point transmission line parameter estimation model with an adaptive data selection scheme based on measured data. Data selection scheme, defined with time window and number of data points, is introduced in the estimation model as additional variables to optimize. The data selection scheme is adaptively adjusted to minimize the relative standard deviation (RSD) of estimated parameters. An iterative technique derived from the Newton method is adopted to solve the proposed model by fitting the relationship between the RSD and data selection scheme with exponential functions. Simulated data are applied to illustrate the performance of the proposed model. Some 500kV transmission lines from a provincial power system of China are estimated to demonstrate the applicability of the presented model. The superiority of the proposed model over fixed data selection schemes is also verified.

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