Improved method for considering PMU’s uncertainty and its effect on real-time stability assessment methods based on Thevenin equivalent

This article characterizes experimentally the relation between phase and magnitude error from Phasor Measurement Units (PMU) in steady state and study its effect on real-time stability assessment methods. This is achieved by a set of laboratory tests applied to four different devices, where a bivariate Gaussian mixture distribution was used to represent the error, obtained experimentally, and later include it in the synthesized PMU measurement using the Monte Carlo Method. Two models for including uncertainty are compared and the results show that taking into account the correlation between magnitude and phase error reduces significantly the uncertainty in the calculated voltage stability indexes for all the study cases.

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