

电力系统仿真及分析计算

电力系统仿真可信度评估方法的研究

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摘要: 提出使用残差可信度指标来表征电力系统动态仿真的整体误差, 使用频率、阻尼和幅值可信度指标来表征暂态信号的特征量误差, 形成了一套比较完整的仿真可信度评估理论体系。各可信度指标具有单调性, 符合电力系统动态变量的特点, 具有明确的物理意义。在LabVIEW环境下开发仿真可信度分析程序, 利用提出的各可信度指标对理想电流波形和故障仿真实验结果进行可信度分析, 给出仿真误差具体的量化指标, 对仿真结果的可信度做出准确客观的评价, 并为模型参数的修正提供数值依据。仿真结果证明了所提出的电力系统仿真可信度评估理论的有效性。

关键词: 电力系统数字仿真 仿真可信度 评估方法 可信度指标

Study of the Credibility Evaluation Method for the Power System Simulation

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Abstract: In this paper, residual credibility index is used to characterize the overall error of the dynamic simulation, and frequency, damping and amplitude credibility indexes are employed to represent the feature error of transient signals respectively, which form a complete simulation credibility evaluation theoretical system. All the credibility indexes have monotonicity, conforming to characters of dynamic variables of the power system, and have clear physics meaning. A calculation program for the simulation credibility evaluation, which was developed in LabVIEW, is employed to analyze the theoretical current waveforms and results of fault simulations by the various indexes. Through the simulation credibility analysis, the material quantitative index of simulation errors is obtained, the credibility of simulation results is evaluated exactly and objectively, and the numerical reference for the modification of model parameters is provided. Simulation results prove the validity of the proposed power system credibility evaluation theory.

Keywords: digital simulation of power system simulation credibility evaluation method credibility index

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