

电力系统

## 基于相图凸凹性和系统辨识理论的暂态稳定性快速预测方法

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摘要

提出了一种与电力系统网络结构、模型以及参数等无关的快速预测暂态稳定性方法。该方法首先基于同步多参数测量装置实时测量的功角以及预测值将系统动态分成两机群, 进而将系统动态等值为两机群系统; 然后利用具有遗忘因子的在线递推最小二乘方法获得两机群等值模型的参数。结合这些参数在线快速估计等值系统的平衡点以及在线快速计算等值系统的稳定裕度DVn, 并利用DVn快速预估系统的稳定性。该方法解决了稳定性预测对系统模型、参数的依赖性以及快速性与准确性之间的矛盾。

关键词

[电力系统](#); [广域信息](#); [轨迹凸凹性](#); [暂态稳定性识别](#); [紧急控制](#)

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## A Method to Fast Predict Power System Transient Stability Based on Concave-Convex of Phase Diagram and System Identification Theory

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Abstract

The authors propose a method to fast predict power system transient stability that does not depend upon network structure, model and parameters of power system. Based on the angle measured by synchronous multi-parameter measurement device and the predictive value of angle, firstly the power system is dynamically divided into two machine-groups, and the power system is further dynamically equivalent to a two machine-group system; then by means of on-line recursive least square with forgetting factor, the parameters of equivalent two machine-group model are obtained. Using these parameters the balance point of the equivalent system is fast estimated and the stability margin of the equivalent system DVn can be fast calculated in on-line mode, thus the DVn can be used to quickly pre-estimate system stability. The proposed method eschews the dependence of stability prediction on system model and load characteristics, and the contradiction between the rapidity and accuracy of estimation is well coordinated.

Key words

[power system](#); [wide-area information](#); [trajectory concave-convex](#); [transient stability identification](#); [emergency control](#)

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