国家重点基础研究项目

基于主导节点法的极限诱导分岔检测方法

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摘要：

为准确定位电压稳定临界点，对极限诱导分岔发生的原因进行了分析，并提出了一种基于主导节点法的分岔类型检测方法。该方法首先利用主导节点法的高效性来追踪PV曲线上的第一个电压失稳点，并确定该点与其前一个运行点(也就是最后一个电压稳定点)之间发生PV节点到PQ节点转换的节点集；然后采用灵敏度法获得上述节点触发无功上限的顺序；最后根据所提的分岔判据对这些节点依次进行检测，快速、准确地追踪到了电压稳定临界点。通过对118节点系统进行仿真，验证了所提方法的有效性。

关键词：

A Practical Approach to Detect Limit Induced Bifurcation Based on Key Node Method

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Abstract:

To accurately determine the critical point of voltage stability, the cause leading to limit induced bifurcation is analyzed, then based on key node method an approach to detect the type of bifurcation is proposed. In the proposed approach, firstly the high efficiency of key node method is utilized to search the first voltage instability point in PV curve and a node set, where the PV nodes were changed into PQ nodes, between the first voltage instability point and previous operation point, i.e., the last one point of voltage stability, is decided; then by use of sensitivity method the sequence of hitting the reactive power limit by above-mentioned nodes is obtained; finally, according to the proposed bifurcation criterion these nodes are detected in turn, thus critical point of voltage stability can be traced rapidly and accurately. The effectiveness of the proposed approach is verified by simulation results of IEEE 118-bus system.

Keywords:

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