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# 不同风电系统动态电压稳定的分岔分析

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**摘要：**

为研究接入风电场的电力系统的风电场注入功率和负荷节点无功功率这2个参数独立及共同作用对系统动态电压稳定的影响，针对接入加入动态负荷模型的异步机风电场和双馈机风电场的单机无穷大系统，分别进行了单参数和双参数分岔分析。分析结果表明，双参数分岔分析相对单参数分岔分析更能揭示系统参数对电压稳定的影响。同一系统结构和参数下，2种系统中当注入功率持续增大时，无功负荷过重会极大降低系统的稳定裕度；当注入功率保持恒定时，无功负荷的变化不影响系统稳定；通过风电场注入功率与无功负荷的协调运作，避开注入功率持续增大时无功负荷重载情况，系统可运行到效率最高；双馈电机风电系统稳定性高于异步电机风电系统，且双馈电机风电系统能得到更准确的系统稳定裕度。

**关键词：**

## Bifurcation Analysis on Dynamic Voltage Stability of Power Grid Connected With Different Wind Power Systems

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Abstract:

To research the influences of individual and combined actions of the two parameters, i.e., the injection active power from wind farm and reactive power at load nodes, on dynamic voltage stability of power grid to which one of the two kinds of wind farms consisting of induction generators and doubly fed induction generators (DFIG) respectively are connected, the one-parameter and two-parameter bifurcation analysis on dynamic models corresponding to above-mentioned two kinds of wind power farms, to which dynamic load model are added, is performed under the condition of typical single-machine infinite bus system connected with one of the two wind farms. Analysis results show that the two-parameter bifurcation analysis can reveal the affection of the parameters on system dynamic voltage stability better than one-parameter bifurcation analysis. Under the same system structure and parameters, when the injection active power from the two kinds of wind farms increases, too heavy reactive power load will extremely decrease stability margin of the system; when injection active power keeps constant, the variation of reactive power load does not affect system stability; by means of coordinative operation of injection active power from wind farm with reactive power load to abstain from the condition that reactive power load is heavy while injection active power continuously increases, the whole system can operate at its highest efficiency; stability of the system connected with wind farm consisting of DFIGs is higher than that connected with wind farm consisting of induction generators, and such a system can attain better system stability margin.

Keywords:

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