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一类非线性系统鲁棒控制及应用

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摘 要: 包含不确定扰动项的线性系统的鲁棒控制表现为 L_2 增益抑制问题. 利用非线性系统线性化技术, 将包含不确定性的非线性模型进行部分线性化处理. 以此为基础, 利用线性系统的鲁棒控制理论, 讨论了单机-无穷大电力系统, 得出发电机的励磁鲁棒控制器; 针对发生三相短路故障的线路末端, 给出了其发电机功角、角速度和输出电压的仿真曲线. 研究表明: 鲁棒控制器在提高系统稳定性、稳定系统输出电压等方面有良好的控制效果.

关键字: 非线性系统; 鲁棒控制; 单机-无穷大系统; 线性化

Robust controller of the excitation for generator

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Abstract: The robust control for linear system with uncertain disturb is discussed, which behaves as L_2 -gain restraint. With linearization for nonlinear system, the nonlinear system with uncertainty is linearized. Based on this, the single-machine infinite-bus power system is studied and the robust controller of excitation for generator is obtained. An example is given that the fault of a three-phase short circuit occurs on the end of the transmission line and is removed in certain period. The simulation curves of the power-angle, angle velocity and voltage output are given, and the robust controller has good effect with respect to improvement for system stability and voltage output.

Key words: nonlinear system; robust control; single-machine infinite-bus system; linearization

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