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统一潮流控制器在动态模拟系统中的应用

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摘要
建立了同步发电机和无穷大容量母线组成的动态模拟系统，考察统一潮流控制器(unified power flow controller，UPFC)在此系统下的稳态和暂态特性。以调节某条线路的有功潮流为例考察了UPFC装置在动模系统中的稳态运行情况，包括潮流和功角的变化情况，仿真和实验结果表明，UPFC能快速平稳地改变系统线路间的潮流分布。在暂态实验中分析了UPFC能改善系统同步稳定性的原因，并通过仿真证实了UPFC装置对功角和潮流的振荡具有抑制作用。

关键词 统一潮流控制器(UPFC)；动态模拟系统；稳态响应；暂态响应；电力系统

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Application of UPFC in Dynamic Simulation System

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Abstract
A dynamic simulation system that is composed of synchronous generator and infinite capacity bus is built and the steady state and transient characteristics of unified power flow controller (UPFC) in this system are researched. Taking the adjustment of active power flow in certain transmission line for example, the steady-state operation of UPFC in dynamic simulation system, including the variation of power flow and angle, is observed. The results from simulation and experiments show that by means of UPFC the power flow distribution among transmission lines can be rapidly and reposefully changed. Through transient experiments, why UPFC can improve synchronous stability of power grid is analyzed. Simulation results also confirm that UPFC can restrain the oscillation of power angle and power flow.

Key words unified power flow controller (UPFC)；dynamic simulation system；steady state response；transient response；power system

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