电力系统

基于逆系统模型的配电网静止同步补偿器双变量非线性控制策略

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摘要：　通过分析配电网静止同步补偿器(distribution static synchronous compensator，DSTATCOM)的输出电压与电网电压的相角差 d 与装置吸收的无功功率和有功功率的关系，建立了DSTATCOM稳态逆系统数学模型。提出以稳态逆系统数学模型为主控制器、电流反馈闭环控制为辅助控制器的双变量(d 和M)电流控制策略，并通过调节 d 角控制直流侧电容电压。同时在补偿电流与直流侧电容电压控制中引入非线性PID控制技术，使得装置具有很好的自适应能力。最后经DSTATCOM模拟装置证明了所提控制方法的可行性和有效性。

关键词：

A Nonlinear Double Variable Control Strategy Based on Inverse System Model of Static Synchronous Compensator for Distribution Network

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Abstract: Based on the analysis on the relation between the phase angle difference of output voltage of distribution static synchronous compensator (STATCOM) for distribution network and network voltage and that between the active and reactive power absorbed by the Statcom, a steady state inverse system model of Statcom for distribution network is built. Taking the phase angle difference and the modulation ratio as the variables, a double variable current control strategy, in which the steady state inverse system model is taken as main controller and the closed-loop current feedback control as auxiliary controller, is proposed, and the capacitor voltage at DC side is controlled by adjusting the phase angle difference. Besides, nonlinear PID control is led into compensation current control and capacitor voltage control to make the Statcom possessing good adaptive ability. The feasibility and effectiveness of the proposed control strategy are verified by simulated experiment of the Statcom for distribution network.

Keywords:

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