基于PSCAD/EMTDC的锁相环建模与性能分析

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摘要： 根据锁相环（PLL）工作原理，在PSCAD/EMTDC中搭建了自定义的PLL模块。在输入电压分别为标准电压、输入电压含谐波、输入电压三相不平衡等几种情况下，对所搭建的自定义模块的动态响应特性和稳态误差变化进行了仿真。通过对PLL系统的线性化模型的分析，得到了PLL的稳定性、稳态误差、调节响应时间和滤波特性。所揭示的PLL参数对PLL各项性能指标的影响为PLL的实际应用提供了参考依据。

关键词： 锁相环；时域特性；频域特性；PSCAD/EMTDC；高压直流输电

Modeling and Analysis of PLL Based on PSCAD/EMTDC

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Abstract: Based on the principium of the PLL a PLL model in PSCAD/EMTDC is set up, and the dynamic response and the steady-error change of this model are studied as the input voltage being respectively standard three-phase AC voltage, harmonious three-phase AC voltage, and unbalance three-phase AC voltage. Characteristics about stability, steady error, regulative time and effect of filter are researched through a linear model of PLL. How the parameters of PLL affect its characteristics provides reference for the real PLL application.

Key words: PLL; characteristic of the time domain; characteristic of the frequency domain; PSCAD/EMTDC; HVDC

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