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电磁式无刷交流同步发电机的MATLAB/PSB建模

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MATLAB/PSB MODEL FOR BRUSHLESS ELECTROMAGNETIC SYNCHRONOUS GENERATOR

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摘要

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摘要 针对电磁式无刷交流同步发电机建模分析的困难,提出一种在MATLAB环境中为此类电机构造PSB模型的方法,即利用PSB中的测量元件模块和受控电源模块沟通电机的数学模型与电路拓扑模型,从而实现了高效率、高质量的“电路—电机—控制”系统的混合仿真。这一建模方法有效地解决了带电力电子装置的复杂电机控制仿真问题,并可方便地推广到各种机电混合系统的建模分析中

关键词: 发电机 建模 无刷励磁 同步电机 混合仿真

Abstract: A new method to construct MATLAB/PSB model for Brushless Electromagnetic Synchronous Generator (BESG) is proposed, in order to overcome the difficulty in modeling and analysis on this kind of electric machine. The key idea of the proposed method is to make use of voltage/current measurement units and controlled voltage/current sources to exchange information between the mathematic model of the electric machine and the topological model of the circuit. The proposed model is able to implement high efficiency and high performance simulation for "circuit/electric machine/control" mixed systems. This method is an efficient solution for simulation modeling of the complicated electric machine with power electronics devices. It greatly reduces the time and energy consume for the construction of simulation models. In addition, it can be extended for modeling various kinds of mixed systems.

Keywords: generator modeling brushless excitation synchronous electric machine mixed model simulation

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