电力系统

Matlab模型接入PSASP暂态稳定计算模块的方法

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摘要
应用Matlab中实时工具包(real-time workshop，RTW)模块的代码自动生成功能，借鉴电力系统分析综合程序(power system analysis software package，PSASP)用户自定义和用户程序接口的实现方法，提出了一种将Matlab Simulink环境中搭建的模型接入PSASP暂态稳定计算模块的方法，并在PSASP7.0版本中予以实现。通过配置RTW代码生成、编译过程，并开发相应的接口程序，可把Matlab Simulink环境中搭建的数学模型自动转换为动态链接库。根据Matlab仿真计算的特点，研究了Matlab模型在PSASP暂态稳定计算模块中调用的流程和方式，提出了两者在状态变量初值计算、积分算法上差异的处理方法，并开发了相应的接口程序。计算结果表明，采用相同功能的Matlab模型和PSASP用户自定义模型，两者暂态稳定计算结果基本一致，验证了文中所提方法的正确性。文中方法实现了Matlab模型接入PSASP进行仿真计算，这为电力系统新型元件和控制装置暂态稳定计算提供了新手段。

关键词　Matlab　电力系统分析综合程序(PSASP)　暂态稳定计算模块

分类号　TM 712

An Approach to Interface Matlab Model with PSASP Transient Stability Module

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Abstract
Using the automatic source code generation function of Real-Time Workshop (RTW) module in Matlab and referring to implementation method of user-defined model and user program interface in Power System Analysis Software Package (PSASP), an approach to interface the model built in Matlab Simulink environment with PSASP transient stability module is proposed and realized by PSASP ver.7.0. By means of configuring RTW source code generation, compiling process, and developing corresponding interface program, the mathematical model built in Matlab Simulink environment can be converted into dynamic link library (DLL) automatically. According to the features of Matlab simulation, the process and manner of calling Matlab based model in PSASP transient stability module are researched, and the method to deal with the difference in initial value calculation of state variables and integration algorithm between Matlab and PSASP is put forward, while corresponding interfacing program is developed. Case study results show that under Matlab based model and user-defined model in PSASP the calculation results by these two methods are basically the same, thus the correctness of the proposed approach is verified. Using the proposed approach, the simulation by interfacing Matlab based model with PSASP is implemented, so a new measure to calculate the transient stability of new components and controllers for power grids is offered.

Key words　Matlab　power system analysis software package (PSASP)　transient stability module

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