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新能源与分布式发电

光伏电池实用仿真模型及光伏发电系统仿真

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摘要:

以光伏电池输出特性为基础，给出了一种适合工程应用的行为仿真模型。该模型通过光伏电池的4个标准性能参数拟合出电池输出外特性，通过引入环境条件修正可以得到不同光强及温度下的性能参数以及较为准确的输出特性。采用该方法对不同类型的光伏电池进行建模，将仿真结果与实测结果进行对比，验证了模型的准确性。在仿真环境PSCAD/EMTDC中建立采用最大功率跟踪控制策略的光伏并网发电系统，验证了该模型的静态及动态仿真效果。

关键词:

Practical Simulation Model of Photovoltaic Cells in Photovoltaic Generation System and Simulation

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Abstract:

A feasible method of modeling the photovoltaic (PV) cells suitable for engineering simulation application is presented based on the voltage-current characteristic of PV cells. Four standard property parameters are employed to shape the output curve of PV cells in this model, and the parameters can be revised according to the different temperature and solar radiation condition under different environment to obtain an accurate output characteristic of PV cells. Then this model is applied to simulate different type of PV cells, and its efficiency is verified by the fact that simulation results match perfectly with experimental results provided by the PV cell manufacturer. Finally a photovoltaic generation system with maximum power point tracking (MPPT) control is constructed with simulation software PSCAD/EMTDC, and the static and transient simulation results demonstrate the effectiveness of above modelling method.

Keywords:

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