

电力系统

基于改进差分进化算法的电力系统最优潮流计算

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摘要:

电力系统的最优潮流计算问题是一个多维非线性优化问题。它通过调节发电机有功出力、机端电压、变压器变比等使发电机组燃料成本函数最小, 并保证所有的约束条件都得到满足。提出了利用改进差分进化算法来解决电力系统的最优潮流问题。IEEE 30节点系统算例表明, 与其他进化类算法相比, 文中算法能够有效减少发电机燃料费用, 并具有良好的寻优能力和收敛特性。

关键词:

Solution of Optimal Power Flow Based on Differential Evolution and its Modified Algorithm

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Abstract:

The calculation of optimal power flow (OPF) is the process to solve a multi-dimensional nonlinear optimization problem. By means of adjusting active output and terminal voltage of generation units as well as transformer voltage ratio to make the fuel cost function minimized and ensure all constraint conditions satisfied. For this purpose, it is proposed to solve OPF by improved differential evolution algorithm. Calculation results of IEEE 30-bus system show that the algorithm utilized in this paper possesses good search ability and convergence performance, and the fuel cost for generation units can be effectively reduced by this algorithm than by other evolutionary algorithms.

Keywords:

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