

Can particle swarm optimization algorithm solve the dispatching optimization of micro-grid?

Particle swarm optimization algorithm has many advantages such as simple structure and fewer parameters to be adjusted, so the method of applying particle swarm optimization algorithm to solve the dispatching optimization of micro-grid is favored by many experts and scholars.

What is particle swarm optimization algorithm?

The improved particle swarm optimization algorithm is used to solve the optimal dispatching problem of the small grid-connected microgrid system. The algorithm parameters are as follows: the maximum number of iterations is 100; the number of particle populations is 100; c_1 and c_2 are 0.85 and 0.95, respectively.

How can particle velocity transformation improve microgrid optimization scheduling?

To enhance the algorithm's performance in microgrid optimization scheduling, this paper improves the particle velocity transformation in the particle swarm algorithm based on improved particle swarm parameters. Specifically, this involves improving the process of particle velocity changes during the PSO process.

Does particle swarm algorithm reduce electricity costs?

Simulation results demonstrate that this model can effectively reduce electricity costs for users and environmental pollution, promoting optimized operation of the microgrid. Moreover, compared to the traditional particle swarm algorithm, the improved particle swarm algorithm offers higher optimization precision. Table 8.

How can particle swarm optimization improve convergence speed and accuracy?

Secondly, in terms of solving the algorithm, the inertia coefficient and learning factor in the particle swarm optimization algorithm were modified to change the particle velocity in the algorithm, and two sets of functions were used to test the performance of the algorithm, thereby improving convergence speed and accuracy.

Can particle swarm optimization solve a multi-objective optimization problem?

Based on establishing the multi-objective mathematical model for optimal dispatching of microgrid, an improved particle swarm optimization algorithm is proposed to solve this multi-objective optimization problem. The experimental results show that the proposed method is effective and practical.

In order to enable the microgrid to meet the system load demand while performing economically optimal operation scheduling, this paper establishes an island-type microgrid model, which is optimized by using an improved immune particle swarm algorithm, and the inertia weight and learning the two parameters of the factor are improved. On the ...

Since the standard particle swarm algorithm is prone to local optimum and premature convergence in solving some problems, some scholars have proposed hybrid particle swarm algorithms to solve practical engineering problems for improving optimization efficiency [27]. In this paper, we developed a hybrid particle swarm optimization algorithm (HPSO) for ...

In today's energy and climate landscape, microgrid technology has emerged as a promising solution to enhance power reliability and grid integration capacity, leading to its widespread adoption. To address the issue of high operating costs in microgrids, this study improves upon the traditional Particle Swarm Optimization (PSO) algorithm by optimizing the inertia weight and ...

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3.2 Improved Particle Swarm Algorithm The performance of the particle swarm optimization algorithm depends to a large extent on the control parameters of the algorithm, that is, the ...

particle swarm optimization algorithm is used to solve the problem. Finally, the simulation results verify the effectiveness of the model and the superiority of the improved algorithm.

An island-type microgrid model is established, which is optimized by using an improved immune particle swarm algorithm, and the inertia weight and learning the two parameters of the factor are improved. In order to enable the microgrid to meet the system load demand while performing economically optimal operation scheduling, this paper establishes an island-type microgrid ...

It is of great significance to study how to use intelligent algorithm to optimize the scheduling of microgrid, so as to improve the operation efficiency of microgrid. In this paper, particle swarm optimization(PSO) algorithm is improved by nonlinearly decreasing inertia weight and nonlinearly dynamic adjusting learning factors. Compared with PSO, the global search ability of the ...

The established model is solved with an improved particle swarm algorithm. At last, taking a microgrid system as an example, the validity and reliability of the proposed model are verified ...

This study suggests the optimized dispatching of the micro-power grid based on the improved particle swarm optimization algorithm (IPSO) for full playing to the power generation advantage of distributed energy. . The complex multi-constraint and multi-objective nonlinear optimization problem of optimal dispatching of micro-grid are paid much attention to the studies. This study ...

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author={Ang Dong and Seon-Keun ...

The traditional particle swarm optimization is improved, and a learning factor and inertia factor with the number of iterations are proposed. Improved particle swarm optimization algorithm can improve the economy and speed of microgrid operation.

3.2 Improved Particle Swarm Algorithm The performance of the particle swarm optimization algorithm depends to a large extent on the control parameters of the algorithm, that is, the number of particles, the fastest speed, the learning factor, the inertia weight, etc. This paper proposes an improved particle swarm optimization algorithm to ...

At present, worldwide research on microgrid optimal dispatching is focused on model optimization, scheduling strategies, and intelligent algorithms. Commonly used algorithms are the particle swarm optimization (PSO) algorithm and its variants, which iteratively search the optimal solution and evaluate the solution quality using fitness factors ...

This article proposes a low-carbon operation analysis method for micro grids based on improved particle swarm optimization algorithm. Corresponding improvements have been made to the inertia weight, learning factor, and individual extreme of the algorithm, depicting the comprehensive low-carbon operation information of micro grids under the influence of carbon ...

Artificial Intelligence (AI) approaches have been used in various aspects of hierarchical control in MGs, such as Particle Swarm Optimization (PSO) 10, Evolutionary Algorithms (EA) 11, grey wolf ...

also incorporates improvements to the traditional particle swarm optimization (PSO) algorithm by considering inertia factors and particle adaptive mutation, and it utilizes the improved algorithm ...

Evolutionary algorithms such as genetic algorithm (GA) [10-13], particle swarm optimization (PSO) [14-17], and gravitational search algorithm [18-23] show some advantages in solving the scheduling problem of microgrid.

On the basis of the immune particle swarm algorithm, a power exponential function operator is added to the inertia weight to improve the search ability of the algorithm, in order to reduce the ...

In exploring multi-objective microgrid operation optimization based on improved particle swarm algorithm, an improved particle swarm algorithm is proposed to address the mutual constraints and conflicts between multiple objectives in the microgrid system, and to achieve a comprehensive optimization of energy supply-demand balance, economic and environmental ...

The function of introducing fuzzy rule system is to dynamically adjust the learning factor and inertia weight of

particle swarm algorithm, and improve the global search ability and local search ability of the algorithm. ... Zhang, L., Zheng, H., Hu, Q.G., Su, B., Lyu, L.: An adaptive droop control strategy for Islanded microgrid based on ...

Contrastively, in the study by Kang et al. (2017), it established a multi-objective optimization model and used the improved particle swarm optimization (IPSO) algorithm to find out the solution with the minimum electricity cost; the results verify that this method can better meet the economic benefits and environmental protection requirements of microgrid power ...

To address the issue of high operating costs in microgrids, this study improves upon the traditional Particle Swarm Optimization (PSO) algorithm by optimizing the inertia weight and ...

In view of the prematurity and convergence problems of the standard particle swarm optimization algorithm, an improved PSO algorithm with adaptive inertia weight and contraction factor is proposed ...

In Ref. [40], an improved quantum particle swarm algorithm is used to solve the economic environmental dispatch problem of microgrid. The operational process and position update formula of quantum ...

Then, an improved particle swarm optimization is proposed. Based on the basic particle swarm optimization (PSO) algorithm, a fuzzy inference system (FIS) is introduced to dynamically adjust the ...

In this paper, a multi-objective optimization mathematical model is established based on the comprehensive consideration of economy, environment and battery circulating power in the process of microgrid dispatching. Aiming at the shortcomings of the traditional multi-objective particle swarm optimization (MOPSO), this paper proposes a multi-objective particle swarm ...

Improved particle swarm optimization algorithm can improve the economy and speed of microgrid operation. The study shows that the model can effectively improve the economic benefits of ...

To enhance the algorithm's performance in microgrid optimization scheduling, this paper improves the particle velocity transformation in the particle swarm algorithm based on improved particle swarm parameters. Specifically, ...

Cao et al. [20] proposed an improved particle swarm optimization algorithm and improved the key parameters to enhance the performance of the algorithm. The results show that, under parallel mode ...



Microgrid Improved Particle Swarm Algorithm

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