

عنوان مقاله:

Controller Design of SSSC for power System Stability Enhancement

محل انتشار:

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خلاصه مقاله:

In this paper, a novel method is developed for designing the output feedback controller for Static Synchronous Series Compensator (SSSC). In the proposed method, the problem of selecting the output feedback gains for the SSSC controllers is changed into an optimization problem with a time domain-based objective function. Then, it is solved by using the particle swarm optimization (PSO) algorithm that has a strong ability to find the most optimistic results. Only local and available state variables are used as the input signals of each controller for the decentralized design. Therefore, the designed SSSC controller has a simple and easy-to-implement structure. The performance of the proposed controllers is evaluated for both single-machine infinite-bus (SMIB) power system and multi-machine power system. Then, to show the robustness and effectiveness of proposed design approach, the results are presented over a wide variety of system configurations, loading conditions, and disturbances. Analyzing the results reveals that the designed PSO-based output feedback SSSC damping controller has a strong ability in damping power system oscillations. Furthermore, analyzing system performance under different operating conditions shows that the ψ -based controller is superior to the m -based controllers.

کلمات کلیدی:

SSSC, Particle Swarm Optimization, damping controller, Power system stability

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