**عنوان مقاله:**

An Optimum Control Strategy of the STATCOM for Electrified Railway Systems Using PSO

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**خلاصه مقاله:**

this paper presents a gain-scheduling adaptive control scheme of a static synchronous compensator (STATCOM) in AC electrified railway systems by means of Particle Swarm Optimization (PSO). A STATCOM with the PSO-implemented controller is considered to reduction harmonic distortion and voltage fluctuations for AC traction loads. Firstly, the dc bus capacitor voltage is measured for achieving to the fitness function to obtain an optimized control of dc bus voltage under dynamic and unbalanced load conditions. Then, the best parameters of the controller Kp and Ki has been evaluated by using PSO as a population-based optimization tool. Finally, the performance of the STATCOM to various loads perturbations and unbalancing has been adaptively controlled with gain-scheduling procedure in terms of reduction stress on the dc bus capacitor voltage. A detailed simulation in MATLAB/Simulink environment has shown that decline of total harmonic distortion (THD) in term of source current in AC electrified railway systems.

**کلمات کلیدی:**

electrified railway systems, static synchronous compensator, indirect current control, harmonic distortion, particle swarm optimization

**لینک ثابت مقاله در پایگاه سیویلیکا:**

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