

## Application of Imperialist Competitive Algorithm for Optimal Location and Sizing of Static Compensator Considering Voltage Profile

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**Abstract :** This paper applies the Imperialist Competitive Algorithm (ICA) to find the optimal place and size of Static Compensator (STATCOM) in power systems. The output of the algorithm is a two dimensional array which indicates the best bus number and STATCOM's optimal size that minimizes all bus voltage deviations from their nominal value. Simulations are performed on IEEE 5, 14, and 30 bus test systems. Also some comparisons have been done between ICA and the famous Particle Swarm Optimization (PSO) algorithm. Results show that how this method can be considered as one of the most precise evolutionary methods for the use of optimum compensator placement in electrical grids.

**Keywords :** evolutionary computation, imperialist competitive algorithm, power systems compensation, static compensators, voltage profile

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