# Optimal Sizing and Sitting of Substations Using Self Adaptive Differential Evolutionary Algorithm

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*Abstract*—In this paper, a novel structure is introduced for simple Differential Evolutionary Algorithm (DEA) to solve Optimal Sizing and Sitting of Substation (OSSS) problem in power systems. In proposed Self Adaptive DEA (SADEA), crossover rate and scaling factor of mutation operator has been adapted by novel equations. To find optimal number, capacity/location and cost of substation installation, a three stage technique is suggested. To verify the effectiveness of the proposed technique, simulation has been implemented on test system with 50 load points and four load levels. Simulation results confirm robustness of proposed technique.