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# **Reactive Power Planning in distribution systems using Black Hole Based Optimization (BHBO) algorithm**

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**Abstract** One goal of reactive power planning is power system voltage profile improvement and this planning is done in such a way that with minimal use of resources and optimize the cost of installing the new reactive power sources. In this thesis, a new optimization method named Black Hole Based Optimization (BHBO) Algorithm is used to solve the problem of reactive power planning. In this study, the capacity of reactive power sources are determined in such a way that in addition to supplying reactive power needed by the system, the project is economically well justified. Also in addition to the cost of reactive power resource installation, voltage profile improvement and loss reduction are considered as the objective function. The problem is simulated in MATLAB software and the results will be discussed.

**Keywords :** Key words: Reactive power planning (RPP), metaheuristic algorithms, Black Hole Based Optimization (BHBO) Algorithm, voltage profile improvement, loss reduction

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