A PARTICLE SWARM OPTMIZATION TECHNIQUE (PSO) FOR POWER FILTER DESIGN

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Abstract. This paper presents the application of a new Particle swarm optimization technique for power system shunt filter design to ensure harmonic reduction and noise mitigation on the electrical utility grid. The proposed filter design is based on the minimization of multi objective functions. The three main filter objective functions are minimum harmonic current penetration into the electric grid system, maximum harmonic current absorption by the harmonic power filter and minimum harmonic voltage distortion at the point of common coupling. Both continuous and discrete type constraints can be included in the power filter parameter estimation. The filter design and optimization is performed over a specified set of discrete dominant offending harmonics.

Keywords: Harmonic filters; Power quality; Particle Swarm Optimization (PSO).