

POWER QUALITY IMPROVEMENT WITH SLIDING MODE CONTROLLED HYBRID ACTIVE POWER FILTER BASED ON VARIABLE SCALING HYBRID DIFFERENTIAL EVOLUTION

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ABSTRACT

With increasing applications of nonlinear and electronically switched devices in distribution systems and industries, power-quality (PQ) problems have become serious concern. The major concentrations in power quality disturbances are kept harmonic current at source side due to inception of non linear loads. Hybrid active filter is one of the most versatile devices to mitigate these power quality disturbances. Hybrid power filter consists of shunt active filter in series with passive filter. The reference currents are generated with sliding mode controller. The gating pulses for the switches in voltage source inverter of Hybrid active filter are generated by hysteresis band current controller. The PI controller in sliding mode controller is further optimized with variable scaling hybrid differential evolution technique. The effective simulations are carried out in MATLAB/Simulink.

KEYWORDS: Power Quality (PQ), Hybrid Active Power Filter (HAPF), Variable Scaling Hybrid Differential Evolution (VSDHE)

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