



Improved Power Energy Quality using a Shunt Active Filter based on Fuzzy Control operating under Non Ideal Voltage Conditions

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Abstract – *This paper presents a three-phase three-wire shunt active filter based on a fuzzy current controller to compensate harmonic current perturbations under non ideal voltage conditions. The control strategy which is adopted uses synchronous reference frame detection method; it is generally used if the source voltage is unbalanced or distorted. Today, fuzzy logic controllers are used in various power electronics applications; their advantages are simple design, no need of mathematical model, based on linguistic description and are more robust than conventional controllers. To compensate the inverter losses and maintain the dc voltage capacitor constant a proportional integral controller is used. The simulation model is developed and performed using MATLAB-Simulink and SimPowerSystem Toolbox. The simulation results obtained show the effectiveness of the proposed Shunt Active Filter (SAF) system under non ideal voltage conditions.*

Keywords: *Shunt active power filter, Fuzzy current controller, Synchronous reference detection method, Harmonic currents compensation, Non ideal voltages conditions.*
