Modeling and Simulation of the Three Phase Systems in Distorted and Unbalanced Conditions

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Abstract— The current waveforms in low voltage electrical networks are frequently harmonic polluted due to actual equipment, most of them being electronically controlled. To reduce the distortions and unbalance effects on the low voltage electrical networks, new methods of monitoring are required, using a more precise set of indicators for power quality analysis. In this paper a modeling of the current waveforms for the three-phase low voltage electrical networks with neutral is done, in conditions of unbalance and distortions, using symmetrical components method. Various studies indicate that deformed and unbalanced regimes are complex processes that require detailed characterization. Using the application developed in Mathcad, the global components of the phase current, unbalance and harmonic distortion indicators are obtained.