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SELECTIVE AND ADAPTIVE HARMONICS ESTIMATION FOR THREE-PHASE SHUNT ACTIVE POWER FILTERS

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Authors

S.M. Peresada[1]*, V.M. Mykhalskyi[2], Y.M. Zaichenko[1], S.M. Kovbasa[1]*****

[1] – National Technical University of Ukraine “Igor Sikorsky Kyiv Polytechnic Institute”,
pr. Peremohy, 37, Kyiv, 03056, Ukraine,
e-mail: sergei.peresada@gmail.com

[2] – Institute of Electrodynamics National Academy of Sciences of Ukraine,
pr. Peremohy, 56, Kyiv, 03057, Ukraine,
e-mail: mikhalsky@ied.org.ua

* ORCID ID : http://orcid.org/0000-0001-8948-722X
** ORCID ID : http://orcid.org/0000-0002-8251-3111
*** ORCID ID : http://orcid.org/0000-0002-2954-455X

Abstract

The paper deals with on-line estimation of three-phase current harmonics on the basis of adaptive control technique. It is shown that standard observer for positive and negative sequences of each harmonic delivers strong selectivity pro-perties, but has limited speed of

convergence and it is suitable when not all harmonics are required to be estimated. A novel structure of estimator with measured currents filtration which guarantees fast asymptotic convergence and simple tuning procedure is proposed. A new approach to shunt active power filter current control based on a combination of current control loop and harmonic estimator is also presented. Proposed approach allows to achieve the asymptotic estimation and asymptotic compensation of all set of harmonics. Simulation and experimental results proof the theoretical findings. References 13, figures 7.

Key words: shunt active power filter, current harmonics, estimation.

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