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SELECTIVE ESTIMATION OF THREE-PHASE CURRENT HARMONICS

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Abstract

In the paper a new method of current harmonics observers configuration for selective detection of distortions is proposed. The relationship between the observer tuning factor and the speed of the estimation and the presence of selectivity properties is obtained. Simulation results confirms theoretical findings and demonstrate the effectiveness of the proposed solution for shunt active power filters with selective harmonics compensation. References 8, figures 4, table 1.

Key words: active power filter, higher-order harmonics, observer, selectivity.

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References

1. Akagi H., Watanabe E.H., Aredes M. Instantaneous Power Theory and Applications to Power Conditioning. Wiley-IEEE Press, 2017. 472 p DOI: <https://doi.org/10.1002/9781119307181>
2. Liu H., Hu H., Chen H., Zhang L., Xing Y. Fast and Flexible Selective Harmonic Extraction Methods Based on the Generalized Discrete Fourier Transform. *IEEE Transactions on Power Electronics* . 2018. Vol. 33. No 4. Pp. 3484-3496. DOI: <https://doi.org/10.1109/TPEL.2017.2703138>
3. IEEE Recommended Practice and Requirements for Harmonic Control in Electric Power Systems. IEEE Std 519-2014. 11 June 2014. Pp.1-29.
4. Kumar D., Zare F. Harmonic analysis of grid connected power electronic systems in low voltage distribution networks. *IEEE Journal of Emerging and Selected Topics in Power Electronics* . 2016. Vol. 4. No 4. Pp. 70-79. DOI: <https://doi.org/10.1109/JESTPE.2015.2454537>
5. Ronchi F., Tilli A. Three-phase positive and negative sequences estimator to generate current reference for selective active filters. Proc *IEEE Mediterranean conference on Control and Automation* . MED'2002. Lisbon, 2002.
6. Peresada S.M., Mykhalskyi V.M., Zaichenko Y.M., Kovbasa S.M. Selective and adaptive harmonics estimation for three-phase shunt active power filters. *Tekhnichna Elektrodynamika*. 2018. No 2. Pp. 29-38. DOI: <https://doi.org/10.15407/techned2018.02.029>
7. Peresada S., Zaichenko Y., Kovbasa S., Nikonenko Y. Three-phase current harmonics estimation for shunt active power filters. Proc. *International Conference on Modern Electrical and Energy Systems* (MEES). 2017. Pp. 272-275. DOI: <https://doi.org/10.1109/MEES.2017.8248908>
8. ABB DRIVES. Technical guide No 6. Guide to harmonics with AC drives. AFE64292714 REV F EN 27.11.2017.

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