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VARIATIONAL METHOD OF MEASURING ANGULAR PHASE DIFFERENCE

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Abstract

Measurement of the phase difference of the two signals has found wide application in various fields of science and technology. However, the existing methods of measurement do not fully meet modern requirements - high speed and high accuracy of phase shift measurement. In this paper we consider a new method for measuring the phase difference, based on the deterministic increment of the initial phase of one of the signals, which makes it possible to achieve high speed and small measurement error, analytical dependencies of the method are derived. The method is based on digital signal processing. References 10, figures 2, table 1.

Key words: AC current, amplitude, phase difference, speed of measurement, accuracy,

variation, uncertainty, digitization, digital filtration, weight window.

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1. Chmykh M.K. Digital phaseometry. Moskva: Radio i sviaz, 1993. 184 p. (Rus)
2. Max J. Methods and technique of signal processing for physical measurements. Moskva: Mir, 1983. Vol. 1-2. (Rus)
3. Eficher E., Jervis B. Digital Signal Processing: A Practical Approach. Moskva: Izdatelskii dom Williams, 2004. 992 p. (Rus)
4. Sergienko A.B. Digital signal processing. Sankt-Peterburg: Piter, 2003. 608 p. (Rus)
5. Ignatiev V.K., Nikitin A.V., Yushanov S.V. Measurement of phase shift of quasiharmonic signals. *Computational methods and programming*. 2013. Vol. 14. Pp. 424-431. (Rus)
6. Bova N.T., Gaizhevsky V.A., Maevsky S.M., Malyebnik V.V. Measurement of angular phase difference at radio electronics. Kyiv: Vysshaia shkola, 1972. 231 p. (Ukr)
7. Ignatiev V.K., Nikitin A.V., Bernardo-Saprykin V.H., Orlov A.A. Measurement of angular phase difference of quasiharmonic signals in real time. *Nauka i obrazovanie*. 2013. No 7. URL: <http://technomag.edu.ru/doc/588392.html>
(Rus)
8. Borshchev P.I. A selective meter of electrical quantities at the industrial frequency. *Tekhnich na Elektrodynamika*. 2005. No 4. Pp. 74–78. (Rus)
9. Borshchev P.I. Analis of the building of digital photodimeters. *y Pratsi Instytutu Elektrodynamiky Natsionalnoi Akademii Nauk Ukrainy*. 2007. Vypusk 16. Pp. 125-126. (Ukr)
10. Du B.Q. High Resolution Frequency Measurement Method with A Wide-Frequency Range Based on Quantized Phase Step Law. *IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control*. 2013. No 60. Pp. 2237–2243.

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