

## Accepted Manuscript

Power System Frequency Tracking Based ON LES Technique with Constant Matrix

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PII: S0263-2241(17)30617-6  
DOI: <https://doi.org/10.1016/j.measurement.2017.09.045>  
Reference: MEASUR 4995

To appear in: *Measurement*

Received Date: 1 April 2017  
Revised Date: 24 September 2017  
Accepted Date: 26 September 2017

Please cite this article as: Z. Đurišić, V. Papić, Power System Frequency Tracking Based ON LES Technique with Constant Matrix, *Measurement* (2017), doi: <https://doi.org/10.1016/j.measurement.2017.09.045>

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**POWER SYSTEM FREQUENCY TRACKING BASED ON LES TECHNIQUE  
WITH CONSTANT MATRIX**

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*Abstract* – This paper describes a new algorithm for measuring the frequency in electric power systems. The algorithm is based on the Least Error Squares (LES) technique and uses digitized samples of voltage at a relay location. The algorithm uses one matrix with constant coefficients which can be previously calculated. It was successfully tested using computer simulated signals and using signals obtained through laboratory tests and field measurements. The test results demonstrate the ability of this algorithm to estimate voltage and frequency with acceptable accuracy.

*Index Terms*—Digital signal processing, Frequency estimation, Least squares methods, Algorithms.

## 1 INTRODUCTION

The frequency of a power network is an important operational parameter for the safety, stability, and efficiency of the power system. Reliable frequency measurement is a prerequisite for the effective power control, load shedding, load restoration, and system protection. Therefore, there is a need for a fast and accurate estimation of the frequency of the power network by using voltage waveforms which may be corrupted by the noise and higher harmonics.

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