

January 16, 2020

Dear Editor,

I would like to submit the manuscript entitled “Influences on amplitude estimation using three-parameter sine fitting algorithm in the velocity mode of the Planck-Balance” by Dr. Shan Lin, Dr. Christian Rothleitner, Norbert Rogge and Prof. Thomas Fröhlich to be considered for publication in the *ACTA IMEKO*.

In this manuscript, we use the three-parameter sine fitting algorithm to estimate the amplitudes of the induced voltage and coil motion in the velocity mode of the Planck-Balance. As the three-parameter sine fitting algorithm is not robust against some perturbations, we investigated some influences on the amplitude estimation, i.e., additive Gaussian white noise, quantization error, harmonic distortion, frequency error and time jitter. According to the theoretical formulars and or the numerical simulation, the three-parameter sine fitting algorithm meets the current requirement of the Planck-Balance.

The submitted manuscript is an extended version of the paper “Amplitude estimation using three-parameter sine fitting algorithm in the Planck-Balance” presented at the 23rd IMEKO TC 4 Symposium, 14-16 September 2019, Xi’an, China. Compared to the conference paper, the following modifications and improvements have been done:

- Introduction about the measurement set-up of the Planck-Balance (in section 3);
- An overview of possible influences of the induced voltage (in figure 2);
- Investigation on more influences on the amplitude estimation of the induced voltage
 - Harmonic distortion (in section 5.3);
 - Time jitter (in section 5.5);
- For the influence of quantization error, a theoretical formula (in equation (12)) is adopted to be compared with the numerical simulation by the Monte Carlo method.

We declare that this manuscript is original and is not currently being considered for publication elsewhere. All authors approved the manuscript and this submission.

Thank you for receiving our manuscript and considering it for review. We appreciate your time and look forward to your response.

Sincerely,

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