

# Accepted Manuscript

Near-field acoustic holography with three-dimensional scanning measurements

Zhong-Wei Luo, Daniel Fernandez Comesana, Chang-Jun Zheng, Chuan-Xing Bi



PII: S0022-460X(18)30652-7

DOI: 10.1016/j.jsv.2018.09.049

Reference: YJSVI 14401

To appear in: *Journal of Sound and Vibration*

Received Date: 17 November 2017

Accepted Date: 25 September 2018

Please cite this article as: Zhong-Wei Luo, Daniel Fernandez Comesana, Chang-Jun Zheng, Chuan-Xing Bi, Near-field acoustic holography with three-dimensional scanning measurements, *Journal of Sound and Vibration* (2018), doi: 10.1016/j.jsv.2018.09.049

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

## Near-field acoustic holography with three-dimensional scanning measurements

Zhong-Wei Luo<sup>a</sup>, Daniel Fernandez Comesana<sup>b</sup>, Chang-Jun Zheng<sup>a</sup>,

Chuan-Xing Bi <sup>a,\*</sup>

<sup>a</sup> *Institute of Sound and Vibration Research, Hefei University of Technology, 193 Tunxi Road, Hefei 230009, People's Republic of China*

<sup>b</sup> *Microflown Technologies, Tivolilaan 205, Arnhem, the Netherlands*

\*Corresponding author. Tel: +86-551-62901339-8208; Fax: +86-551-62901335.

*E-mail address:* cxbi@hfut.edu.cn

### ABSTRACT

Data acquisition is one of the key steps in near-field acoustic holography. Most of the existing measurement methods become time-consuming or even impractical when the total number of measurement points is excessively large, for example for the sound field reconstruction of a large-scale source or for a mid-high frequency problem. Alternatively, a three-dimensional scanning near-field acoustic holography (3DSNAH) method is hereby proposed to overcome such problems providing the sound field is time stationary. The **data measurement** of a large number of points can be accomplished in a matter of minutes by using scanning measurements to acquire the holographic data. The data is then used in an inverse boundary element method to obtain a detailed reconstruction of the sound field radiated by the sound source. The experimental comparison with the traditional point-by-point measurement method demonstrates that the proposed method can acquire holographic data of good quality and reconstruct the sound field with a reasonable accuracy, which verifies the feasibility of the 3DSNAH.

**Keywords:** Near-field acoustic holography; Holographic data measurement; 3D scanning measurement; Inverse boundary element method

Download English Version:

<https://daneshyari.com/en/article/11012570>

Download Persian Version:

<https://daneshyari.com/article/11012570>

[Daneshyari.com](https://daneshyari.com)