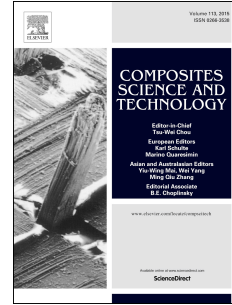


Accepted Manuscript

U-DMA measurement and dynamic analysis of ultrasonic wave propagation in particulate composites

Ran Li, Hong Xia, Zhenzhen Xu, Qing-Qing Ni, Yaqin Fu



PII: S0266-3538(16)30533-4

DOI: [10.1016/j.compscitech.2017.08.022](https://doi.org/10.1016/j.compscitech.2017.08.022)

Reference: CSTE 6877

To appear in: *Composites Science and Technology*

Received Date: 16 June 2016

Revised Date: 12 July 2017

Accepted Date: 18 August 2017

Please cite this article as: Li R, Xia H, Xu Z, Ni Q-Q, Fu Y, U-DMA measurement and dynamic analysis of ultrasonic wave propagation in particulate composites, *Composites Science and Technology* (2017), doi: 10.1016/j.compscitech.2017.08.022.

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.

U-DMA measurement and dynamic analysis of ultrasonic wave propagation in particulate
composites

Ran Li^a, Hong Xia^b, Zhenzhen Xu^c, Qing-Qing NI^{b,c,*}, Yaqin Fu^{d,*}

a. Interdisciplinary Graduate School of Science and Technology, Shinshu University, Tokida, Ueda
386-8576, Japan

b. Department of Mechanical Engineering & Robotics, Shinshu University, Tokida, Ueda 386-8576,
Japan

c. College of Textile and Garments, Anhui Polytechnic University, Wuhu, Anhui, China

d. Key Laboratory of Advanced Textile Materials and Manufacturing Technology, Ministry of
Education, Zhejiang Sci-Tech University, Hangzhou, China

*Corresponding author, E-mail: niqq@shinshu-u.ac.jp; fyq01@zstu.edu.cn.

Abstract

This work is dedicated to a high-precision ultrasonic testing technology for dynamic mechanical evaluation of particle reinforced composite materials. The detailed ultrasonic wave propagation due to multi-reflection and scattering waves by particles and matrix viscoelasticity, especially the mutual interactions among particles, are systematically clarified. Through a unique material evaluation method, Ultrasonic Dynamic Mechanical Analysis (U-DMA), the dynamic viscoelasticity of particulate composites with different types and contents of particles are measured directly in high frequency domain. Furthermore, based on the experiment data, the ultrasonic propagation behaviors are detailedly investigated by a newly developed time-domain finite element analysis code, Pzflex, for investigating the detailed mechanisms of particles. The results clarify that the particle interactions are playing a major role in ultrasonic wave propagation and attenuation properties, which can significantly affect the viscoelastic characteristics of developed

Download English Version:

<https://daneshyari.com/en/article/5022295>

Download Persian Version:

<https://daneshyari.com/article/5022295>

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