

Author's Accepted Manuscript

A wear particle identification method by combining principal component analysis and grey relational analysis

Jingqiu Wang, Xiaolei Wang



www.elsevier.com/locate/wear

PII: S0043-1648(13)00263-9
DOI: <http://dx.doi.org/10.1016/j.wear.2013.04.021>
Reference: WEA100724

To appear in: *Wear*

Received date: 4 February 2013
Revised date: 8 April 2013
Accepted date: 13 April 2013

Cite this article as: Jingqiu Wang, Xiaolei Wang, A wear particle identification method by combining principal component analysis and grey relational analysis, *Wear*, <http://dx.doi.org/10.1016/j.wear.2013.04.021>

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 galley proof before it is published in its final citable 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.

A wear particle identification method by combining principal component analysis and grey relational analysis

Jingqiu Wang, Xiaolei Wang*

Jiangsu Key Laboratory of Precision and Micro-Manufacturing Technology,

Nanjing University of Aeronautics & Astronautics, Nanjing 210016, China

Abstract: The process to identify wear particles concerns a variety of parameters, some of which may be redundant, and influences the efficiency of computer image analysis. In order to improve the accuracy and speed of debris identification, this paper proposes a new algorithm that combines principal component analysis and grey relational analysis (CPGA). First, principal component analysis is used to optimise the characteristic parameters of wear particles. Then, an improved grey relational analysis is used to discriminate between similar types of wear particles, such as severe sliding and fatigue particles. The experimental results indicate that the CPGA algorithm can successfully solve the information redundancy problem resulting from multiple parameters and proves to be a practical method to identify wear particles quickly and accurately.

Keywords: Ferrography; Wear particle identification; Principal component analysis; Grey relational analysis

1. Introduction

Wear debris from lubricating systems contains detailed and important information about the wear conditions in machines. Presently, oil and debris analysis are still very useful in wear

* Corresponding author. Tel.: +86-25-84893630; fax: +86-25-84893630.
E-mail addresses: wxl@nuaa.edu.cn

Download English Version:

<https://daneshyari.com/en/article/7004748>

Download Persian Version:

<https://daneshyari.com/article/7004748>

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