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**Microwave**  
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Testing And  
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The papers published  
in these proceedings  
represent the latest

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**developments in the  
nondestructive  
characterization of  
materials and were  
presented at the  
Eleventh International  
Symposium on  
Nondestructive  
Characterization of  
Materials held in June  
2002, in Berlin,  
Germany.  
Most books on  
nondestructive**

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Destructive  
Testing And  
Evaluation  
evaluation (NDE)  
focus either on the  
theoretical

background or on  
principles reprint  
advanced applications.

Bridging the gap  
between the two,  
Ultrasonic and  
Electromagnetic NDE  
for Structure and  
Material

Characterization:  
Engineering and  
Biomedical

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Applications brings  
Testing And  
Evaluation  
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ultrasonic and  
Non-destructive  
evaluation (NDE)  
methods have  
dominated most of the  
fields of applied  
research and  
technology over the  
last twenty years.

**These techniques**

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**provide information  
on the functional  
efficiency of materials  
and structures without  
causing any structural  
impact on the  
structure itself. Their  
use enables the  
monitoring of the  
structural integrity,  
the structural  
condition as well as the  
service in-duced  
degradation of**

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Destructive  
materials and  
Testing And  
structures during their  
service life. In this  
Principles Reprint  
respect, they address a  
vast field of  
applications ranging  
from the aerospace  
and automotive  
industry to civil  
engineering structures  
and material quality  
control. This volume  
comprises scientific  
papers presented

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**during the Fifth**

**Conference on**

**Emerging**

**Technologies in Non-**

**Destructive Testing**

**(Ioannina, Greece,**

**19–21 September**

**2011). A broad**

**spectrum of related**

**research was presented**

**during the course of**

**the conference,**

**including optical,**

**acoustic, thermal,**

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electrical and  
electromagnetic  
methods together with  
imaging tomographic  
and signal processing  
techniques. Special  
attention was given to  
NDE for Civil  
Engineering  
Structures and for the  
first time in the  
conference series, a  
multiple session on  
NDE for the protection**



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of cultural heritage  
was organized.

**Emerging  
Technologies in Non-  
Destructive Testing V**  
contains contributions  
by experts in this field  
from 22 different  
countries worldwide.  
Reflecting the stateof-  
the-art in Non-  
Destructive  
Evaluation, the book  
will prove to be a

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Testing And  
Evaluation  
valuable companion to  
students, engineers  
and industrial

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partners who are  
active in the field of  
non-destructive  
evaluation and testing.  
This volume will also  
provide students and  
researchers with  
insight into the focal  
points of  
contemporary research  
efforts in the field of

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**non-destructive  
evaluation.**

**This book is intended  
to help satisfy an  
urgent requirement  
for up-to date  
comprehensive texts at  
graduate and senior  
undergraduate levels  
on the subjects in non-  
destructive testing  
(NDT). The subject  
matter here is  
confined to electrical**

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**and magnetic methods,  
with emphasis on the  
widely used eddy  
current and magnetic  
flux leakage methods  
(including particle  
inspection), but proper  
attention is paid to  
other techniques, such  
as microwave and AC  
field applications,  
which are rapidly  
growing in  
importance.**

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**Theoretical analyses relating to the various methods are discussed and the depths of presentation are often governed by whether or not the information is readily available elsewhere. Thus, for example, a considerable amount of space is devoted to eddy current theory at what the author**

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**considers to be a  
reasonable standard  
and not, as usually  
experienced, in either**

**a too elementary  
manner or at a level  
appreciated only by a  
postgraduate  
theoretical physicist.  
The inclusion of the  
introductory chapter is  
intended to acquaint  
the reader with some  
of the philosophy of**

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**NDT and to compare,  
briefly, the relative  
performances of the  
more important  
methods of testing.**

**Engineering  
Applications of the  
Modulated Scatterer  
Technique  
Electromagnetic  
Nondestructive  
Evaluation XXII  
Microwave NDT**

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**Microwaves and  
Testing And  
Metals**

**Electromagnetic Non-  
Destructive Evaluation  
(XXI)**

*Using microwaves to  
treat metal-based  
materials is rapidly  
emerging as an energy-  
efficient tool to interact  
with metals for a  
number of processes  
such as sintering,  
melting, brazing,*

*Page 16/158*



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*carburizing and annealing. Microwaves can sinter a wide variety of metal compacts with comparable or enhanced end properties, while at the same time delivering tremendous energy savings over conventional sintering. Microwave processes are therefore gaining increasing attention and*

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*Destructive  
Testing And  
Evaluation*  
*adoption in both  
academia and industry.*

*Gupta and Wong have  
written this  
comprehensive text to  
introduce readers to the  
world of microwaves  
and the interaction of  
microwaves with metals  
and metals-based  
formulations. The  
authors have combined  
numerous research  
results from a wide*

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*range of sources  
alongside their own  
work in the field. Also  
included are overviews  
of microwave heating of  
other non-metal  
materials and the  
equipment used for  
microwave-assisted  
metallurgy. With  
microwave techniques  
poised for widespread  
adoption, Microwaves  
and Metals is an*

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*Destructive  
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Evaluation*  
*essential text for all  
metallurgists and  
materials engineers.*

*Principles Reprint*  
*Provides a thorough  
grounding in microwave  
fundamentals and their  
application to metals  
processing Informs  
readers of the latest  
developments in the  
field Presents a  
convenient single source  
for all aspects of  
microwave processing*

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*of metals and materials  
Contains liberal  
illustration to compare  
and benchmark  
research results*

*Introduces all the  
necessary equipment,  
preparing readers for  
real-world practice  
Microwaves and Metals  
is ideal for a post-  
graduate or advanced  
undergraduate course in  
materials science or*

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Evaluation*  
*metallurgy. Materials  
and metallurgical  
engineers in industry,  
who are keen on  
cheaper, faster  
techniques, will also  
benefit from this book.*

*Microwave Non-  
Destructive Testing and  
Evaluation*

*Principles Springer  
Science & Business  
Media*

*Ultrasonic methods*

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*destructive testing and evaluation of materials. This book deals with both industrial ultrasound and medical ultrasound. The advantages of ultrasound include flexibility, low cost, in-line operation, and providing data in both signal and image formats for further*

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*destructive analysis. The book  
Testing And  
Evaluation  
devotes 11 chapters to  
ultrasonic methods.*

*Principles Reprint  
However, ultrasonic  
methods can be much  
less effective with some  
applications. So the  
book also has 14  
chapters catering to  
other or advanced  
methods for  
nondestructive testing  
or material  
characterization. Topics*



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*Destructive  
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Evaluation  
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*like structural health monitoring, Terahertz methods, X-ray and thermography methods are presented. Besides different sensors for nondestructive testing, the book places much emphasis on signal/image processing and pattern recognition of the signals acquired. Maximizing reader insights into the use of*

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*thermography,  
specifically pulsed and  
pulse phase*

*thermography (PT and  
PPT), for the  
identification of kissing  
defects in adhesive  
bonds, this thesis  
focuses on the  
application of PT and  
PPT for the  
identification of a range  
of defect types in a  
variety of materials to*

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*destructive*  
Testing And  
Evaluation  
*establish the effect of  
material properties on  
identification of defects.*

*Featuring analysis of a  
numerical model  
developed to simulate  
the thermal evolution  
created during a PT or  
PPT experiment, after  
validation through a  
series of case studies,  
this model is then used  
as a predictive tool to  
relate defect*

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*Destructive  
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*detectability to the  
thermal property  
contrast between defect  
and bulk materials.*

*Demonstrating a means  
of producing realistic  
kissing defects in  
bonded joints where  
insufficient thermal  
property contrast exists  
defects have a limited  
effect on heat  
propagation through a  
component and*

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*therefore are not detected using PT or PPT, this thesis discusses the addition of a small load to bonds containing kissing defects which was found to open the defects sufficiently to enable their detection. A low cost infrared detector, Flir Tau320, is compared to the research based photon*

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*detector, Flir SC5000,*  
Testing And  
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*and is shown to be*  
*suitable for application*  
*in PT, thus enabling a*  
*significantly lower cost*  
*tool to be developed.*  
*Industrial Radiography*  
*and Non-destructive*  
*Testing*  
*Emerging Technologies*  
*in Non-Destructive*  
*Testing VI*  
*Measurement and*  
*Materials*

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*Characterization  
Proceedings of the 2017  
fib Symposium, held in  
Maastricht, The  
Netherlands, June  
12-14, 2017*

*Nondestructive Testing  
and Evaluation of Fiber-  
Reinforced Composite  
Structures*

*British Journal of Non-  
destructive Testing*

This collection of  
conference papers on

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non-destructive testing covers such topics as: electromagnetic method; NDE in nuclear industry; non-destructive evaluation of composites; NDE for medical applications; microwave non-destructive evaluation; and imaging for NDE applications.

A comprehensive and updated overview of the



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theory, algorithms and applications of for electromagnetic inverse scattering problems

Offers the recent and most important advances in inverse scattering grounded in fundamental theory, algorithms and practical engineering applications Covers the latest, most relevant inverse scattering

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Principles and  
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reversal, linear  
sampling, qualitative  
methods, compressive  
sensing, and  
noniterative methods  
Emphasizes theory,  
mathematical derivation  
and physical insights of  
various inverse  
scattering problems  
Written by a leading  
expert in the field

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This book contains the proceedings of the fib Symposium "High Tech Concrete: Where Technology and Engineering Meet", that was held in Maastricht, The Netherlands, in June 2017. This annual symposium was organised by the Dutch Concrete Association and the Belgian Concrete Association.

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Topics addressed include: materials technology, modelling, testing and design, special loadings, safety, reliability and codes, existing concrete structures, durability and life time, sustainability, innovative building concepts, challenging projects and historic concrete, amongst

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others. The fib  
(International  
Federation for  
Structural Concrete) is  
a not-for-profit  
association committed  
to advancing the  
technical, economic,  
aesthetic and  
environmental  
performance of concrete  
structures worldwide.  
Non-Destructive Testing  
(NDT) is of worldwide

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significance, and is strongly related to the detection of damage in engineering structures (buildings, bridges, aircrafts, ships, pressure vessels, etc.) using non-invasive techniques (ultrasound, X-rays, Radar, neutrons, thermography, vibrations, acoustic emission, etc.).

Emerging Technologies

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in Non-D  
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Trends in NDE Science  
and Technology  
High Tech Concrete:  
Where Technology and  
Engineering Meet  
Microwave Electronics  
Ultrasonic and  
Advanced Methods for  
Nondestructive Testing  
and Material  
Characterization  
Materials  
Characterization Using

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Nondestructive  
Testing And  
Evaluation (NDE)  
Methods

Ultrasonic and  
Electromagnetic NDE  
for Structure and  
Material  
Characterization

**This chapter  
discusses the  
principle and  
application of two  
model-based  
algorithms for**



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processing non-  
Testing And  
dispersive and  
Explosion  
dispersive ground  
Principle Report  
penetrating radar  
(GPR) data over  
layered medium  
under monostatic  
antenna  
configuration. Both  
algorithms have  
been selected for  
their super-time  
resolution capability  
and reduced

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computational  
burden; they allow  
GPR to measure a  
layer thickness  
smaller than the  
fraction of the  
dominant  
wavelength. For non-  
dispersive data, the  
ESPRIT algorithm is  
generalized to  
handle different  
kinds of data  
models encountered

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Principles

**in experiments and  
in the literature. For  
dispersive data, the  
proposed adaptation  
of the MPM  
algorithm allows  
recovering the full-  
time resolution and  
jointly estimating  
the time delays and  
quality factors of a  
layered medium with  
reduced bias. Both  
processing**

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Techniques are  
applied to probe-  
layered roadways  
for NDT&E  
purposes.

Due to the  
spectacular growth  
of electronic  
systems and the  
steady demand for  
new services with  
increased  
functionality, the  
development of

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more efficient  
Testing And  
measurement  
techniques has  
Principles Reprint  
paramount  
importance. This  
practical resource  
details the cutting-  
edge Modulated  
Scatterer Technique,  
which offers a low-  
invasive and rapid  
method for testing  
and measuring

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systems and  
equipment used in a  
wide range of  
electronic Reprint  
engineering  
applications.  
Extensively  
referenced with 125  
illustrations and 100  
equations.  
Materials  
Characterization  
Using  
Nondestructive**

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Testing And  
Principles Repair  
Evaluation (NDE)  
Methods discusses  
NDT methods and  
how they are highly  
desirable for both  
long-term  
monitoring and  
short-term  
assessment of  
materials, providing  
crucial early  
warning that the  
fatigue life of a  
material has

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destructive  
Testing And  
Evaluation  
elapsed, thus  
helping to prevent  
service failures.

Materials Reprint

Characterization

Using

Nondestructive

Evaluation (NDE)

Methods gives an

overview of

established and new

NDT techniques for

the characterization

of materials, with a



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**focus on materials  
used in the  
automotive,  
aerospace, power  
plants, and  
infrastructure  
construction  
industries. Each  
chapter focuses on  
a different NDT  
technique and  
indicates the  
potential of the  
method by selected**

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examples of  
applications.

Methods covered  
include scanning  
and transmission  
electron  
microscopy, X-ray  
microtomography  
and diffraction,  
ultrasonic,  
electromagnetic,  
microwave, and  
hybrid techniques.  
The authors review

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**both the  
determination of  
microstructure  
properties, including  
phase content and  
grain size, and the  
determination of  
mechanical  
properties, such as  
hardness,  
toughness, yield  
strength, texture,  
and residual stress.  
Gives an overview**

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**of established and  
new NDT  
techniques,  
including scanning  
and transmission  
electron  
microscopy, X-ray  
microtomography  
and diffraction,  
ultrasonic,  
electromagnetic,  
microwave, and  
hybrid techniques  
Reviews the**

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Testing And  
Evaluation  
determination of  
microstructural and  
mechanical

properties Focuses  
on materials used in  
the automotive,  
aerospace, power  
plants, and  
infrastructure  
construction  
industries Serves as  
a highly desirable  
resource for both  
long-term

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monitoring and  
Testing And  
short-term  
Evaluation  
assessment of  
Materials Reprint  
The first  
international  
symposium on NDT-  
CE (Non-Destructive  
Testing in Civil  
Engineering) was  
held in Berlin,  
Germany in 1991.  
Successive  
symposia were held**

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throughout Europe  
Testing And  
5th symposium is  
Evaluation Reprint  
organized as  
SEIKEN  
SYMPOSIUM No. 26,  
and is sponsored by  
the Institute of  
Industrial Science,  
at the University of  
Tokyo, Japan.  
Original objectives  
of the NDT-CE  
symposium have**

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**been to provide an opportunity for discussing current issues and future perspectives of NDT and for promoting mutual understanding among engineers and researchers. Asia is one of the key regions for further development in NDT and this**



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**symposium in Japan  
will be a good  
opportunity not only  
to exchange  
technical  
information on NDT,  
but to promote  
worldwide  
friendship between  
engineers in Asian  
countries and other  
nations of the world.  
This volume  
contains 70 papers**

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providing the most  
recent research  
results and findings.

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grouped under the  
following areas: (1)  
keynote papers, (2)  
magnetic / electric,  
(3) steel structures,  
(4) integrated test,  
(5) moisture, (6)  
strength, (7)  
acoustic emission,  
(8) various tests, (9)

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ultrasonic, (10)  
Testing And  
impact echo, (11)  
radar, (12) quality  
and (13) corrosion /  
Printed Report  
cover.

**Polymer  
Composites in the  
Aerospace Industry  
Proceedings of the  
International  
Seminar Held at the  
University of  
Dundee, Scotland,  
UK on 5-6**

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September 2002

Testing And

Proceedings of  
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on Advances in Non-

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The Proceedings of

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Conference on

Sensing and

Imaging, 2018

Emerging

Technologies in Non-

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V

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Methods for  
Electromagnetic  
Inverse Scattering

*The development of high speed, high frequency circuits and systems requires an understanding of the properties of materials functioning at the microwave level. This*

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*comprehensive  
reference sets out to  
address this  
requirement by*

*providing guidance on  
the development of  
suitable measurement  
methodologies  
tailored for a variety  
of materials and  
application systems.  
Bringing together  
coverage of a broad*

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*range of techniques  
in one publication for  
the first time, this  
book: Provides a  
comprehensive  
introduction to  
microwave theory and  
microwave  
measurement  
techniques. Examines  
every aspect of  
microwave material  
properties, circuit*

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*design and  
applications. Presents  
materials property  
characterisation  
methods along with a  
discussion of the  
underlying theory.  
Outlines the  
importance of  
microwave absorbers  
in the reduction in  
noise levels in  
microwave circuits*



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*and their importance  
within defence  
industry applications.  
Relates each  
measurement  
technique to its  
application across the  
fields of microwave  
engineering, high-  
speed electronics,  
remote sensing and  
the physical sciences.  
This book will appeal*

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*to practising  
engineers and  
technicians working  
in the areas of RF,*

*microwaves,  
communications, solid-  
state devices and  
radar. Senior  
students, researchers  
in microwave  
engineering and  
microelectronics and  
material scientists will*

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*also find this book a  
very useful reference.*

*This book presents a  
detailed description of  
the most common  
nondestructive  
testing(NDT)  
techniques used for  
the testing and  
evaluation fiber-  
reinforced composite  
structures, during  
manufacturing*

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*and/or in service stages. In order to facilitate the understanding and the utility of the different NDT techniques presented, the book first provides some information regarding the defects and material degradation mechanisms observed*

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*in fiber-reinforced  
composite structures  
as well as their  
general description  
and most probable  
causes. It is written  
based on the extensive  
scientific research  
and engineering  
backgrounds of the  
authors in the NDT  
and structural health  
monitoring (SHM) of*

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*structural systems  
Testing And  
Evaluation  
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*from various areas  
including electrical,  
mechanical,  
materials, civil and  
biomedical  
engineering. Pursuing  
a rigorous approach,  
the book establishes a  
fundamental  
framework for the  
NDT of fiber-  
reinforced composite*

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*structures, while  
emphasizing on the  
importance of  
technique's spatial  
resolution, integrated  
systems analysis and  
the significance of  
the influence  
stemming from the  
applicability of the  
NDT and the physical  
parameters of the test  
structures in the*

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*selection and  
utilization of  
adequate NDT  
techniques. The book  
is intended for  
students who are  
interested in the NDT  
of fiber-reinforced  
composite structures,  
researchers  
investigating the  
applicability of  
different NDT*



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*techniques to the  
inspections of  
structural systems,  
and NDT researchers  
and engineers  
working on the  
optimization of NDT  
systems for specific  
applications involving  
the use of fiber-  
reinforced composite  
structures.*

*The feasibility of*  
Page 73/158

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*using two new  
techniques for non-  
destructive testing  
applications, one  
based on the use of  
microwaves, the other  
on acoustic surface  
waves was explored.  
The microwaves  
scanning microscope  
technique differs  
from other  
microwaves n.d.t.*

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*destructive systems in that it aims not only to determine the existence of a defect, but also to locate it. The location is effected with an accuracy which is more than two orders of magnitude better than the wavelength of the microwaves used. The acoustic surface wave*

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*technique differs from those previously employed in that the authors have adopted a holographic technique, whereby it is possible to record the acoustic field along a single line, and from this recover the complete field. It is therefore able to detect defects in the*

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*surface of a sample  
by reconstruction  
based on a single  
record. The method is  
based on the use of a  
phase sensitive laser  
probe, followed by  
subsequent computer  
reconstruction. Using  
this technique the  
authors have been  
able to detect very  
small defects on a*

*destructive  
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*quartz surface. It is possible that the technique can be used effectively for determining surface flaws in highly polished surfaces.*

*Electromagnetic Nondestructive Evaluation (ENDE) is a technique crucial to a great many engineering activities,*

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*as well as to  
environmental  
evaluation and  
protection issues. It is  
a discipline  
recognized for its  
theoretical insight,  
efficient models and  
simulations, robust  
data interpretation,  
and accurate  
instrumentation. This  
book presents*

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*contributions from  
the 22nd ENDE*

*International*

*Workshop, held in*

*Saclay, France, in*

*September 2017. It*

*includes 1 of the 3*

*keynotes and 34 peer-*

*reviewed and extended*

*versions of the 47 oral*

*contributions*

*delivered during the*

*workshop. Topics*



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advanced sensors;  
adaptive databases;  
model selection and  
the qualification of  
uncertainty; multi-  
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*diagnosis of  
mechanical  
structures; and  
innovative industrial  
applications. The  
book will be of  
interest to all those  
whose work involves  
the development or  
use of  
electromagnetic non-  
destructive evaluation.*

*Experimental*

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*Mechanics*

*December 4-5, 1980,*

*Central Complex*

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*Bombay--400085*

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*and ASW*

*Holographic*

*Techniques for*

*N.D.T.*

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*Principle and Devices  
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Materials XI*

**Concrete is a  
global material  
that underwrites  
commercial  
wellbeing and  
social  
development.  
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***substitute that  
can be used on  
the same  
engineering  
scale and its  
sustainability,  
exploitation and  
further  
development are  
imperatives to  
creating and  
maintaining a***

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*healthy*  
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*worldwide. The  
pressure for  
change and  
improvement of  
performance is  
relentless and  
necessary.  
Concrete must  
keep evolving to*

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*satisfy the  
increasing  
demands of all  
its users.*

*This book  
comprises the  
proceedings of  
the Conference  
and Exhibition  
on Non  
Destructive  
Evaluation,*

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*(NDE 2019). The contents of the book encompass a vast spectrum from*

*Conventional to Advanced NDE including novel methods, instrumentation, sensors, procedures and*



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***data analytics as  
applied to all  
industry  
segments for  
quality control,  
periodic  
maintenance,  
life estimation,  
structural  
integrity and  
related areas.  
This book will***

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***be a useful  
reference for  
students,  
researchers and  
practitioners.***

***Polymer  
Composites in  
the Aerospace  
Industry,  
Second Edition,  
summarizes the  
latest research***

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*and*  
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developments  
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on the design,  
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manufacture  
*and*  
performance of  
composite  
components for  
aerospace  
structures.  
Sections cover  
the modeling,

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***structure and  
behavior of 2D  
and 3D woven  
composites, the  
manufacture  
processes used  
for composite  
materials and  
components,  
buckling and  
compressive  
strength of***

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***laminates and  
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manufacturing  
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defects in  
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composite  
materials,  
aspects of  
composite  
performance in  
aerospace  
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modeling  
stiffness and  
strength of  
structural  
elements,  
fatigue under  
uniaxial and  
multiaxial loads,  
fracture  
mechanics,  
impact strength*

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crashworthiness  
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, design and  
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failure analysis  
of bolted joints,  
and much more.  
This updated  
edition is an  
essential  
reference  
resource for  
engineers,***

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*scientists and  
designers  
working in the  
development of  
composite  
materials in  
aerospace  
applications.  
Presents  
detailed  
discussions on  
the design,*

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***modeling and  
analysis of  
conventional  
and advanced  
polymer  
composites used  
in aerospace  
applications  
Provides an in-  
depth  
understanding  
of the***

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**performance  
parameters of  
aerospace  
composites,  
such as  
strength,  
stiffness and  
fatigue, impact  
and blast  
resistance**  
**Includes  
significant**

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**developments  
that have  
occurred since  
2015 (in  
production and  
manufacturing,  
fatigue  
modeling, test  
standards,  
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*aircraft wings  
and fuselage  
Non-destructive  
testing (NDT) is  
based on  
inspection  
methodologies  
that do not  
require the  
change or  
destruction of  
the component*

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*destructive  
Testing And  
Evaluation*  
**or system under  
evaluation.**

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**Numerous NDT  
techniques are  
increasingly  
used, thanks to  
the recent  
advances in  
sensing  
technologies,  
data acquisition,  
data storage and**

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**signal  
processing.**

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**Inspection  
information is  
widely employed  
in order to make  
effective  
maintenance  
decisions based  
on the defects  
identified, their  
location and**

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***severity. This  
book presents  
the main  
advances***

***recently made  
on different  
NDT techniques,  
together with  
the principal  
approaches  
employed to  
process the***



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**signals obtained  
during  
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*Belgium, 27-29  
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Composites*

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Germany, June  
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Evaluation  
New Techniques  
for Acoustic Non-  
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Testing***

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*The use of electromagnetic nondestructive evaluation has grown*

*significantly in recent years. This valuable technique enables the assessment of*

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*objects by  
observing the  
electromagneti  
c response to*

*electric  
currents  
and/or  
magnetic  
fields*

*introduced  
within them.*

*This book*

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ectromagnetic  
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Evaluation  
(ENDE2018),  
held in  
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*signal*  
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*materials*  
*state*  
*awareness and*  
*characterizati*  
*on; damage*  
*diagnosis and*  
*prognosis;*

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*biomedical  
applications;  
and innovative  
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applications  
of eNDE.*

*Providing a  
comprehensive  
overview of  
current  
theoretical  
and applied*

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*research into*  
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*methods, the*  
*book will be*  
*of interest to*  
*all those*  
*whose work*  
*involves the n*

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*on-destructive  
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evaluation of  
objects,  
whatever their  
field.*

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Materials Char  
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*zation of*  
*materials at*  
*microwave*  
*frequencies,*  
*in terms of*  
*quantitative*

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permittivity  
and*

*permeability.*

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zation of  
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materials, and  
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tissues.

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clear, simple,  
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novel and  
unified manner  
the most used  
methods of  
experimental



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*mechanics of  
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of*

*displacements,  
strains and  
stresses.*

*Emphasis is  
given on the  
principles of  
operation of  
the various*

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*book is*  
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*include strain*  
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c moiré,  
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terferometry,  
holography,  
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residual  
stresses. The  
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used not only  
Testing And  
as a learning  
Evaluation  
tool, but as a  
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basis on which*

*the*

*researcher,*

*the engineer,*

*the experiment*

*alist, the*

*student can*

*develop their*

*new own ideas*

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solids.

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matrix  
composites in  
structural  
applications  
has led to the

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*growing need  
for a very  
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quality*

*control and  
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products to  
ensure and  
monitor  
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*explores a*

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*techniques and*

*the use of*

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*techniques in*

*a variety of*

*application*



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*areas. Part  
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and NDT  
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including eddy  
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applications.*

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focuses on NDE  
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and flaw chara  
cterisation.  
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*and emerging  
NDE techniques  
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marine*

*applications  
is explored in  
part four.*

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*polymer matrix*  
*composites is*  
*a technical*  
*resource for*  
*researchers*  
*and engineers*  
*using polymer*

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*professionals*  
*requiring an*  
*understanding*  
*of non-*  
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*and academics*  
*interested in*  
*this field.*

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*and NDT*

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*considers*

*future trends*

*Examines in*

*detail NDE*

*techniques for*

*adhesively*

*bonded*

*applications*

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*including  
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impact damage,  
ultrasonic  
techniques and  
structural  
health  
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Defect  
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in Bonded  
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Testing*

*Microwave testing  
has been paid only*

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*Examination*  
*Principles Reprint*  
scant attention in the literature as a method for nondestructive testing of materials, yet it offers some attractive features, especially for the testing of composite and other non-metallic materials.

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*techniques have*  
*been used in a large*

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number of  
Testing And  
be classified as  
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nondestructive  
testing applications,  
ranging from large  
scale remote sensing  
to detection of  
tumors in the body.  
This volume  
describes a unified  
approach to  
microwave  
nondestructive*

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*testing by presenting  
the three essential  
components of  
testing: theory,  
practice, and  
modelling. While  
recognizing that each  
of these subjects is  
wide enough to  
justify a volume of its  
own, the presentation  
of the three topics  
together shows that  
these are interrelated*

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*and should be  
practiced together.  
While few will argue  
against a good  
theoretical  
background,  
modelling and  
simulation of the  
testing environment  
is seldom part of the  
NDT training in any  
method, but  
particularly so in  
microwave testing.*

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*The text is divided in four parts. The first part presents the field theory background necessary for understanding the microwave domain. The second part treats microwave measurements as well as devices and sources and the third part discusses*

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*practical tests  
applicable to a  
variety of materials  
and geometries. The  
fourth part discusses  
modelling of  
microwave testing.  
Each chapter  
contains a  
bibliography intended  
to expand on the  
material given and, in  
particular, to point to  
subjects which could*



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*destructive  
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not be covered either  
as not appropriate or  
for lack of space. For  
engineers, applied  
physicsts, material  
scientists.

*Principles Reprint*  
Microwave and  
millimeter-wave non-  
destructive testing  
and evaluation  
(NDT&E) is generally  
understood to mean  
using high-frequency  
electromagnetic

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energy to inspect and  
Test And  
materials and  
structures. In spite of  
possessing some  
distinct advantages  
in certain  
applications to other  
NDT&E techniques,  
microwave NDT&E  
has only found  
compared limited  
practical application  
during the past 45

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*years. These advantages include lack of a need for contact between the sensor and the object being inspected, the ability to penetrate dielectric materials, and superior sensitivity to certain material constituents and flaws. One factor contributing to this minimal acceptance*

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*by the NDT &E community has been a generally poor understanding in this community of the theory and practice that underlie the technology. This situation exists partly because of a paucity of microwave NDT&E textbook and reference material.*

*Some chapters,*

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*destructive*  
*reviews, and books*  
*aimed at filling this*  
*need have been*  
*published in the past*  
*but, for the most*  
*part, this material is*  
*based on the use of*  
*older microwave*  
*technology. However,*  
*during the past ten*  
*years great strides*  
*have been made in*  
*terms of the cost,*  
*size, and ease of use*

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*of microwave  
components. In  
addition, recent  
advances in modeling  
and measurement  
techniques have  
expanded the range  
of applications for  
microwave NDT&E.  
Such applications  
include inspecting  
modern materials  
such as composites,  
detecting and*

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*destructive  
Testing And  
Evaluating the  
compressive strength  
of cement structures.  
These advances have  
created an urgent  
need for up-to-date  
textbook material on  
this subject.*

*The book deals with  
fundamental concept,  
theory and designs,  
as well as*

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*destructive applications of microwaves in details. In addition it also describes EMI and EMC, Microwave hazards, and applications of microwaves in medicals. Radars and Radar devices, and MASERS have also been described properly in this book. Microwave antennas*



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*have been explained  
with emphasis on  
theory of operation  
and design  
procedures. The book  
also focuses on  
microwave  
measurements along  
with necessary  
requirements and  
different methods of  
measurement.*

*This book  
proceedings collects*

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a number of papers  
presented at the  
International

*Conference on  
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