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in Non Homogeneous Media**
Editors: A. Leger, M. Deschamps

Alain Leger
Marc Deschamps

Editors

Ultrasonic Wave Propagation in Non Homogeneous Media

With 168 Figures

 Springer

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Preface

The Research Network GDR 2501 deals with Ultrasonic wave propagation in non-homogeneous media for Non Destructive Testing applications. This group gathers researchers of various backgrounds in applied mathematics as well as in experimental physics. Founded in January 2002 as a CNRS unit, it became Anglo-French in January 2006. Now, it consists of 32 departments or laboratories evenly distributed between France and UK. Different research institutions and industrial departments support the network: CEA, EDF, EADS, Dassault Aviation, Renault, ONERA, LCPC, INRIA from the French side, EPSRC and English companies through RCNDE from the British side.

The fifth meeting of the GDR was held in Anglet, France, from June 2nd to June 6th 2008. Forty oral presentations and ten posters made at the meeting have been devoted to the following research topics:

- bonding,
- propagation in composites,
- guided waves,
- contact or damage non-linearities in acoustics,
- inverse problems and imaging,
- structural noise.

The program offered a wide-ranging view of the present state of the art in the research for Non Destructive Testing and Non Destructive Evaluation applications. Four keynote lectures have been chosen either precisely in the field of the GDR:

- Ultrasonic arrays: the post processing approach, by Professor Bruce Drinkwater,
- Reverse time migration technique coupling with finite element methods, by Dr H el ene Barucq,

or in the near fields of interest:

- Acoustic cloaking theory, by Professor Andrew Norris,
- On the use of (static) digital image correlation for identifying material heterogeneities and non linear behaviors, by Professor St ephane Roux.

This volume gives a comprehensive account of the presentations made at the conference. The sequence of papers follows the meeting schedule, which has been intentionally arranged to mingle talks on the theory and on various applications. It reflects a strong link between different aspects of the research scope of the conference. With a view to foster interaction and cohesion between the theoretical and applied communities, each paper has been reviewed in real-time during the conference by two participants, one theoretician and one experimentalist or engineer.

The organizers and the 85 participants have been pleased to observe that the conference has provided an excellent opportunity for exchanging ideas and developing collaborations. It was also beneficial for the PhD student participants who could gain an overview of the cutting-edge research in the field.

The editors would like to stress the fact that this volume could not have been published had not Beatrice Desoudin been so efficient in her work. All the material organization of the meeting has rested on her shoulders and she also has found time to help in the compilation of articles presented herein.

The next meeting will be held in the Lake District in UK. We hope for the same success as at the present one, and we are looking forward to reaching a next step in active co-operation within the GDR 2501, the network of British and French Laboratories.

Marseille/Talence, October 2008

Alain Leger, Marc Deschamps

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