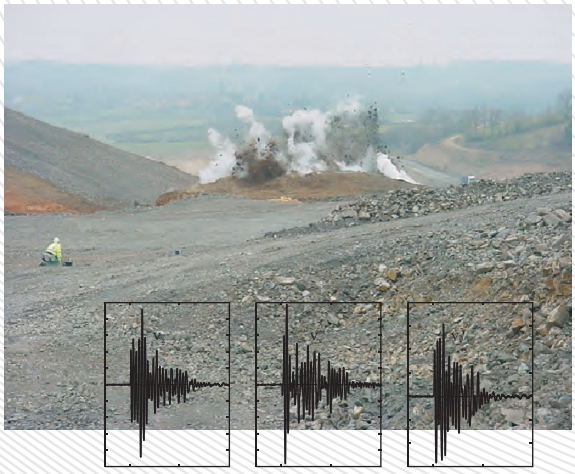
WAVES AND VIBRATIONS IN SOILS
EARTHQUAKES, TRAFFIC, SHOCKS, CONSTRUCTION WORKS

Jean-François Semblat
Senior Researcher at Laboratoire Central des Ponts et Chaussées, Paris, France; Assoc. Professor, Department of Mechanics, Ecole Polytechnique, France.

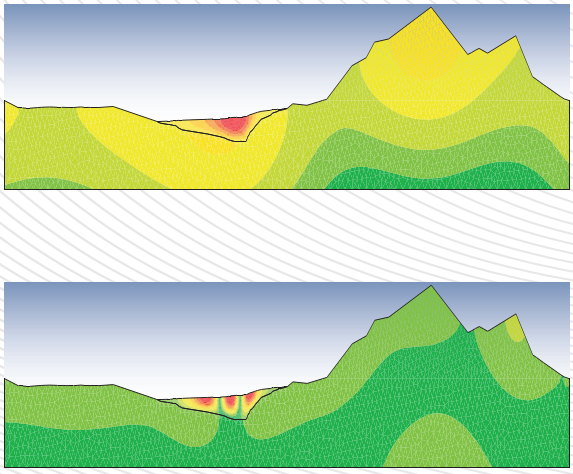
Alain Pecker
Chairman and Managing Director of Géodynamique et Structure, France; Professor, Department of Civil Engineering, Ecole Nationale des Ponts et Chaussées, France.

Date of publication: Feb 2009
Number of pages: 500
ISBN: 978-88-6198-030-3

The main scientific and engineering goal of this book is to deal simultaneously with soil dynamics/vibrations and wave propagation in soils (including seismic waves). These various fields are generally considered separately and the important links between them, both from scientific and practical points of view, are unfortunately not investigated. They are usually considered in separate disciplines such as earthquake geotechnical engineering, civil engineering, mechanics, geophysics, seismology, numerical modelling, etc.
The objective of the book is to offer in a single publication an overview of soil dynamics and wave propagation in soils with emphasis on engineering applications. It starts from a wide variety of practical problems (e.g. traffic induced vibrations, dynamic compaction, vibration isolation), then deals with 1D and 2D/3D wave propagation in heterogeneous and attenuating media (with application to laboratory and in situ dynamic characterization of soils), gives an overview of various numerical methods (e.g. FEM, BEM) to simulate wave propagation (including numerical errors, radiation/absorbing conditions, etc) and finally investigates seismic wave propagation and amplification in complex geological structures (e.g. irregular topographies, alluvial deposits).



Blast induced vibrations in soils
(picture and recorded velocities)



Seismic wave amplification due to topography
and alluvial deposits (Caracas, Venezuela)

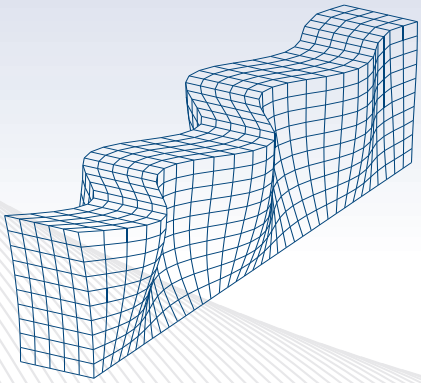
Contacts and Information

IUSS Press
Institute of Advanced Study of Pavia
e-mail: info@iusspress.it
e-mail: luisa.corona@eucentre.it
website: www.iusspress.it
phone (+39) 0382.516931

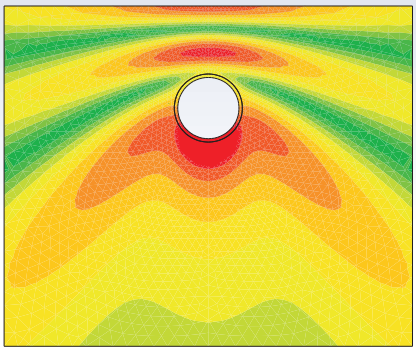
C/o **EUCENTRE** Foundation
Via Ferrata, 1
27100 Pavia, Italy
e-mail: info@eucentre.it
phone (+39) 0382.516911
fax (+39) 0382.529131

WAVES AND VIBRATIONS IN SOILS
EARTHQUAKES, TRAFFIC, SHOCKS, CONSTRUCTION WORKS

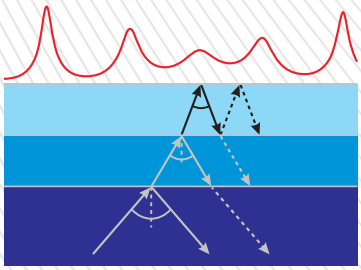
Propagation of a surface wave



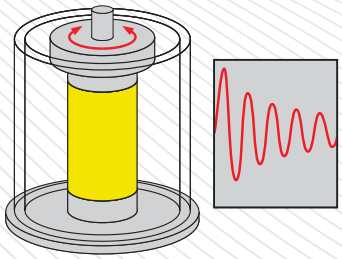
Railway induced vibrations around a tunnel.



Wave propagation in soil layers and transfer function showing amplification peaks.



Resonant column test and amplitude decay.



Jean-François Semblat is Head of the Dynamics,Waves and Vibrations Unit in the Division for Soil and Rock Mechanics at Laboratoire Central des Ponts et Chaussées (Paris, France) and Associate Professor at Ecole Polytechnique (Palaiseau, France). He has published over 100 technical papers in journals and conferences. He is on the editorial board of the International Journal of Geomechanics (ASCE) and European Journal of Environmental and Civil Engineering. He is member of the Scientific Committees of the French Association for Earthquake Eng. and the French Society of Soil Mechanics and Geotechnical Engineering. He is member of the board of the International Association for Computer Methods and Advances in Geomechanics and is associate member of the American Society of Civil Engineers (ASCE). He has received several awards for his work: French Association for Earthquake Eng., European Association of Geoscientists and Eng., International Association for Computer Methods in Geomechanics.

Alain Pecker is Chairman and Managing Director of Géodynamique et Structure, Professor at Ecole Nationale des Ponts et Chaussées and Visiting Faculty at the Centre for Post-Graduate Training and Research in Earthquake Engineering and Engineering Seismology (ROSE School, IUSS Pavia). He is member of the French National Academy of Technologies, Honorary President of the French Association for Earthquake Engineering, Past President of the French Society of Soil Mechanics and Geotechnical Engineering, President of the French Committee for Seismic Building Codes. He is also a member of several international technical committees dealing with earthquake geotechnical engineering. He has also published over 80 technical papers in journals and conferences and has been invited as lecturer or State of the Art speaker in several international events. He is on the editorial boards of three international journals. He has received several awards for his work, among which one from the French National Academy of Sciences.

IUSS Press
Institute of Advanced Study of Pavia

New Release

www.iusspress.it