

CURRICULUM VITAE

Nom : ABRAHAM **Prénoms :** Odile Nicole Louise
Date de naissance : 20 novembre 1966 **Age :** 54 ans

Organisme d'affectation : Univ. Eiffel **Corps :** TPE **Grade :** IDTE
Département / Laboratoire : GERS / Geophysique et Evaluation Non Destructive
Dates d'affectation dans l'organisme : 01/08/91

Téléphone : 02 40 84 59 18 **Télécopie :** 02 40 84 59 97 **E-Mail :** odile.abraham@univ-eiffel.fr

Adresse professionnelle : CS4 BP 44344 Bouguenais Cedex France

Diplôme et titres universitaires

- 1990 Diplôme d'Ingénieur des Travaux Publics de l'Etat
- 1990 DEA Acoustique et Vibration de l'Ecole Centrale de Lyon
- 1993 PhD, University of Wales College of Cardiff, Grande Bretagne
- 2004 Habilitation à Diriger des Recherches, Université de Nantes

Langues : Français (langue maternelle), Anglais (lu, écrit, parlé), Espagnol (notions)

Déroulement de carrière :

- 1993-2021 Chercheuse spécialisée sur les méthodes sismiques/ultrasonores pour l'auscultation des objets du génie civil
- 1997-2000 Co-animatrice de la Commission Technique « Mesure et Traitement de l'Information » du Pôle des Sciences de l'Ingénieur du LCPC
- 2002-2004 Animatrice de l'Opération « Champ physique et Propagation dans les sols et les structures du génie civil » du Comité de Programme LCPC « Auscultation, Surveillance et Diagnostic des Ouvrages, Reconnaissance des Sols Pathologie des ouvrages »
- 2006-2009 Coordinatrice du symposium international NDTCE'09
- 2012-2015 Présidente du Conseil Scientifique Restreint du Groupement d'Intérêt Scientifique LiRGcC (Institut Ligérien de Recherche en Génie Civil et Construction)
- 2012-2017 Pilote du Groupement d'Échange et de Recherche de l'Ifsttar « Evaluation Non destructive »
- 2011-2017 Membre du Comité AFF40 du TRB (USA) on Field Testing and Nondestructive Evaluation (NDE) of Transportation Structures
- 2001-2004 Membre du Conseil d'Administration de la Confédération Française pour les
- 2010-2013 Essais Non Destructifs (COFREND)
- 2016-2020 Coordinatrice du projet européen [H2020-MSCA-ITN INFRASTAR](#)
- 2015 -2021 Directrice du laboratoire Géophysique et Évaluation Non Destructive (Département GERS)
- 2013 → Membre du bureau du Pôle Scientifique et Technique de la Confédération Française pour les Essais Non Destructifs ([COFREND](#))
- 2015 → Co-organisatrice des doctoriales de la COFREND
- 2019 → Coordinatrice de l'[InfraStar Training School®](#)
- 2018 → Directrice du GIS Évaluation et Contrôle Non Destructif en Pays de la Loire ([ENCD_PdL](#))

Formation continue : 2019 Formation Python / 2019 Formation « prise de parole sensible » / 2012 et 2019 H0 H1 M1 / 2010 Formation sur les incertitudes de mesure / 2007 Formation Lecture rapide / 2004 Formation Management / 2002 Stage CNRS « Ondelettes » / 2000 Formations CESAR, HTML / 1994 → 1996 3 stages LCPC sur les méthodes statistiques / 1995 Stage "Système d'acquisition de signaux : conception et réalisation" à Supélec / 1994 Cours INRIA sur les méthodes numériques d'ordre élevé pour les ondes en régime transitoire / 1993 Cours INRIA sur les ondes guidées et résonances.

Affiliations en cours de validité : COFREND, AFGC, SFA

Prix : 1990-1993 : British Council grant

2005 : EAGE Mintrop Award pour l'article **Abraham O.**, Chammas R., Côte Ph., Pedersen H.A., Semblat J.-F., *Mechanical characterisation of heterogeneous soils with surface waves : experimental validation on reduced scale physical models*, Near Surface Geophysics, 2(4), pp249-258, 2005.

Publications :

- Chen G., Zhang Y., **Abraham O.**, Pageot D., Chekroun M., Tournat V., Numerical parametric study of Nonlinear Coda Wave Interferometry sensitivity to microcrack size in a multiple scattering medium, *Ultrasonics*, 2021. <https://doi.org/10.1016/j.ultras.2021.106483>
- Wang A., Leparoux D., **Abraham O.**, Lefeuvre M., Frequency derivative of Rayleigh wave phase velocity for fundamental mode dispersion inversion: parametric study and experimental application, *Geophysical Journal International*, 2020. <https://doi.org/10.1093/gji/ggaa417>
- Bassil A., Chapeleau X., Leduc D., **Abraham O.**, Concrete Crack Monitoring Using a Novel Strain Transfer Model for Distributed Fiber Optics Sensors, *Sensors* 2020, 20, 2220. <https://doi.org/10.3390/s20082220>
- Gallezot M., Treysède F., **Abraham O.**, Forced vibrations and wave propagation in multilayered solid spheres using a one-dimensional semi-analytical finite element method, *Wave Motion*, 96, 2020 <https://doi.org/10.1016/j.wavemoti.2020.102555>
- Thery R., Guillemot A., **Abraham O.**, Larose E., Tracking fluids in multiple scattering and highly porous materials: toward applications in non-destructive testing and seismic monitoring, *Ultrasonics*, 102, 2020. <https://doi.org/10.1016/j.ultras.2019.106019>
- Chen G., Pageot D., **Abraham O.**, Zhang Y., Chekroun M., Tournat V., *Nonlinear Coda Wave Interferometry: sensitivity to wave-induced material property changes analyzed via numerical simulations in 2D*, *Ultrasonics*, 99, 2019. <https://doi.org/10.1016/j.ultras.2019.105968>
- Bassil A. Wang X., Chapeleau X., Niederleithinger N., **Abraham O.**, Leduc D., Distributed Fiber Optics Sensing and Coda Wave Interferometry Techniques for Damage Monitoring in Concrete Structures, *Sensors*, 19, 356, 2019. <https://doi.org/10.3390/s19020356>
- Legland J.-B., Zhang Y., **Abraham O.**, Durand O., Tournat V., *Evaluation of crack status in a meter-size concrete structure using the ultrasonic nonlinear coda wave interferometry*, *JASA*, 142, 2233, 2017. <http://dx.doi.org/10.1121/1.5007832>
- Chen G., Pageot D., Legland J.-B., **Abraham O.**, Chekroun M., Tournat V., *Numerical modeling of ultrasonic coda wave interferometry in a multiple scattering medium with a localized nonlinear defect*, *Wave Motion*, 72, pp228-243, 2017. <http://dx.doi.org/10.1016/j.wavemoti.2017.03.004>
- Zhang Y., Tournat V., **Abraham O.**, Durand O., Letourneur S., Le Duff A., Lascoup B., *Nonlinear modulation of ultrasonic coda waves for the global evaluation of damage levels in complex solids*, *Ultrasonics*, 73, pp245-252, 2017. <http://dx.doi.org/10.1016/j.ultras.2016.09.015>
- Hilloulin B., Legland J.-B., Lys E., **Abraham O.**, Loukili A., Grondin F., Durand D., Tournat V., *Monitoring of autogenous crack healing in cementitious materials by the nonlinear modulation of ultrasonic coda waves, 3D microscopy and X-ray microtomography*, *JCBM*, 123, pp143-152, 2016. <http://dx.doi.org/10.1016/j.conbuildmat.2016.06.138>
- Metais V., Chekroun M., Le Marrec L., Le Duff A., Plantier G., **Abraham O.**, *Influence of multiple scattering in heterogeneous concrete on results of the surface wave inverse problem*, *International Journal of Nondestructive Testing and Evaluation*, 79, pp.53-62, 2016. <http://dx.doi.org/10.1016/j.ndteint.2015.12.004>
- Hilloulin B., Zhang Y., **Abraham O.**, Loukili A., Grondin F., Durand O., Tournat V., *Small crack detection in concrete with coda wave nonlinear modulation*, *International Journal of Nondestructive Testing and Evaluation*, 68, pp.98-104, 2014. <http://dx.doi.org/10.1016/j.ndteint.2014.08.010>
- Lascoup B., **Abraham O.**, Le Duff Alain, Tournat V., *Suivi de l'endommagement de composite par l'étude de la CODA ultrasonore*, *Revue des composites et des matériaux avancés*, 24(2), pp177-189, 2014. <http://dx.doi.org/10.3166/RCMA.24.177-189>
- Caussignac J.M., Le Cam V., **Abraham O.**, Dérobert X., Villain G., *Evaluation et contrôle non destructifs en génie civil*, *Techniques de l'Ingénieur*, r1410, pp1-20, 2013. <http://www.techniques-ingenieur.fr/base-documentaire/mesures-analyses-th1/cnd-applications-sectorielles-42587210/evaluation-et-contrôle-non-destructifs-en-genie-civil-r1410/>
- Zhang Y., Tournat V., **Abraham O.**, Le Duff A., Lascoup B., Durand O., *Nonlinear mixing of ultrasonic coda waves with lower frequency-swept pump waves for a global detection of defects in multiple scattering media*, *Journal of Applied Physics*, 113, 064905 (2013). <http://dx.doi.org/10.1063/1.4791585>
- Garnier V., Piwakowski P., **Abraham O.**, Villain G., Payan C., Chaix J.-F., *Acoustical techniques for concrete*

evaluation: Improvements, comparisons and consistencies, JCBM, 43, pp598-613, 2013.
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Brethaud F., Brossier R., Leparoux D., Operto S., **Abraham O.**, Virieux J., *2D elastic full waveform imaging of the near surface : Application to a physical scale model*, Near Surface Geophysics, 2013.
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Zhang Y., **Abraham O.**, Loukili A., Grondin F., Tournat V., Le Duff A., Lascoup B., Durand O., *Validation of a thermal bias control technique for Coda Wave Interferometry (CWI)*, Ultrasonics, 53(3), pp658-664, 2013.
<http://dx.doi.org/10.1016/j.ultras.2012.08.003>

Zhang Y., **Abraham O.**, Tournat V., Le Duff A., Lascoup B., Loukili A., Grondin F., Durand O., *Study of stress-induced velocity variation in concrete under direct tensile force and monitoring of the damage level by using thermally-compensated Coda Wave Interferometry*, Ultrasonics, 52(8), pp1038-1045, 2012.
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Schoefs F., **Abraham O.**, *Probabilistic evaluation for improvement of design of impact-echo sources*, Transportation Research Record, 2313, pp109-115, 2012. <http://dx.doi.org/10.3141/2313-12>

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<http://dx.doi.org/10.1016/j.conbuildmat.2012.02.002>

Benmeddour F., Villain G., **Abraham O.**, Choinska M., *Development of an ultrasonic experimental device to characterise concrete for structural repair*, JCBM, 37, pp934-942, 2012.
<http://dx.doi.org/10.1016/j.conbuildmat.2012.09.038>

Abraham O., Piwakowski B., Villain G., Durand O., *Non-contact, automated surface wave measurements for the mechanical characterisation of concrete*, JCBM , 37, pp904-915, 2012.
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<http://dx.doi.org/10.1016/j.ultras.2009.05.006>

Bodet L., **Abraham O.**, Clorennec D., *Near-offset effects on Rayleigh-wave dispersion measurements: physical modeling*, Journal of Applied Geophysics, 68(1), 95-103, 2009.
<http://dx.doi.org/10.1016/j.jappgeo.2009.02.012>

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Bodet L., Van Wijk J., Bitri A., **Abraham O.**, Côte Ph., Grandjean G., Leparoux D., *Surface-wave inversion limitations from laser-Doppler physical modelling*, Journal of Environmental and Engineering Geophysics, 10(2), pp151-162, 2005. <http://dx.doi.org/10.2113/JEEG10.2.151>

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Abraham O., Dérobert X., *Non-destructive testing of fired tunnel walls: The Mont-Blanc Tunnel case study*, International Journal of Nondestructive Testing and Evaluation, 36, pp411-418, 2003.
[http://dx.doi.org/10.1016/S0963-8695\(03\)00034-3](http://dx.doi.org/10.1016/S0963-8695(03)00034-3)

Abraham O., Côte Ph., *Impact-echo thickness frequency profile for the detection of voids in tendon duct*,

ACI Structural Journal, 99(3), pp239-247, 2002.

Dérobot X., Aubagnac C., **Abraham O.**, *Comparison of NDT techniques on a post-tensioned beam before autopsy*, International Journal of Nondestructive Testing and Evaluation, 35, pp241-248, 2002.
[http://dx.doi.org/10.1016/S0963-8695\(02\)00027-0](http://dx.doi.org/10.1016/S0963-8695(02)00027-0)

Abraham O., Alexandre J., Gourry J.-C., Grandjean G., *3D seismic imagery for the detection of small cracks*, European Journal of Environmental and Engineering Geophysics, 4(2), pp171-193, 2000.

Abraham O., Léonard Ch., Côte Ph., Piwakowski B., *Time frequency analysis of impact echo signals: numerical modeling and experimental validation*, ACI Materials Journal, 97(6), pp612-624, 2000.

Abraham O., Pedersen H., Hevin G., Kergadallan X., Côte Ph., *Use of surface waves for the nondestructive testing of concrete structures*, Insight: Non-Destructive Testing and Condition Monitoring, 42(7), pp444-446, 2000.

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Celse B., Vayssade B., Henry J.-P., Côte ph., **Abraham O.**, Piwakowski B., *Détection de failles par méthodes sismiques lors du creusement des tunnels*, Bulletin des Laboratoires des Ponts et Chaussées, 226, pp13-25, 2000. <http://www.geotech-fr.org/sites/default/files/revues/blpc/BLPC%20226%20pp%2013-25%20Celse.pdf>

Abraham O., Ben Slimane K., Côte Ph., *Seismic tomography : factoring anisotropy into iterative geometric reconstruction algorithms*, International Journal of Rocks Mechanics and Mining Sciences, 35(1), 9931-41, 1998.

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Gourry J.-C., Grandjean G., **Abraham O.**, *Geophysical imagery of small-scale fractures*, European Journal of Environmental and Engineering Geophysics, 1, pp187-199, 1996.

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Abraham O.N.L., Brandon J., Cohen A., *Remark on the determination of compliance coefficients at the crack section of a uniform beam with circular cross-section*, Journal of Sound and Vibration, 169(4), pp570-574, 1994.

Ouvrages :

Payan C., **Abraham O.**, Garnier V., *Ultrasonic methods, in Non-Destructive Testing and Evaluation of Civil Engineering Structures*, ISTE Press Ltd. Published by Elsevier Ltd., Edited by JP Balayssac and Vincent Garnier, ISBN 978-1-78548-229-8, 2018, pp21-85. <https://doi.org/10.1016/B978-1-78548-229-8.50002-9>

Abraham O., Popovics J.S., *Impact-echo techniques for evaluation of concrete structures*, in Non-destructive evaluation of reinforced concrete structures, Vol.2, Woodhead Publishing Limited, CRC Press N10267, ISBN 978-1-84569-950-4, 2010, pp466-489.

Popovics J.S., **Abraham O.**, *Surface wave techniques for evaluation of concrete structures*, in Non-destructive evaluation of reinforced concrete structures, Vol.2, Woodhead Publishing Limited, CRC Press N10267, ISBN 978-1-84569-950-4, 2010, pp441-465.

Abraham O., Krause M., *Impact echo*, in COST 534 New Materials, Systems, Methods and Concepts for Prestressed Concrete Structures, Final Report, Edited by Polder RB, ISBN 978-9-0598-63323, 2009, pp137-148.

Proceedings of the 7th International Symposium on Non Destructive Testing in Civil Engineering, 30 june – 3 july 2009, Edited by **Abraham O.**, Dérobot, X., ISBN 978-2-7208-2542-5, DOI/CrossRef: 10.3829/act-actndtce-fr

Methodologie d'évaluation non destructive de l'état d'altération des ouvrages en béton, sous la direction de D. Breyssse et **O. Abraham**, Presses des Ponts et Chaussées, ISBN 2-85978-405-5, 2005, 555p.

Champs physiques et propagation dans les sols et les structures du génie civil, sous la direction de

Abraham O., SI11, Etudes et recherches des laboratoires des ponts et chaussées, ISSN 1167-4865, 2006, 221p.