



19th International
Nondestructive Testing
and Evaluation of
Wood Symposium

September 22 - 25, 2015
Rio de Janeiro - Brazil



United States Department of Agriculture, Forest Service
University of Campinas, College of Agricultural Engineering
Brazilian Society of Non-Destructive Testing and Inspection

Conference Guide Book



About Event

The 19th International Nondestructive Testing and Evaluation of Wood Symposium is a forum for those involved in nondestructive testing and evaluation of wood, wood-based materials and products. It will bring together the international nondestructive testing and evaluation research community, users of various nondestructive testing technologies, equipment development and manufacturing professionals, representatives from various government agencies and other groups to share research findings and new nondestructive testing products and technologies.

Objective

The objectives of this symposium are:

1. To provide the international nondestructive testing and evaluation of wood research community a venue to present results from their latest research and technology transfer activities;
2. To capture, through the symposium's proceedings, their findings and make them available to scientists and engineers from around the world.

Organization/Committee

Co-Chairs

- Dr. Robert J. Ross, Project Leader, USDA Forest Products Laboratory, USA;
- Dr. Raquel Gonçalves, Professor, University of Campinas, Brazil

International Organizing Committee

- Brian K. Brashaw, Program Director, University of Minnesota Duluth, USA;
- Dr. Ferenc Divos, Professor, University of West Hungary, Hungary;
- Dr. Robert J. Ross, Project Leader, USDA Forest Products Laboratory, USA;
- Dr. Xiping Wang, Research Forest Products Technologist, USDA Forest Products Laboratory, USA;
- Dr. Francisco Arriaga Martitegui, Professor, Universidad Politécnica de Madrid, Spain;
- Dr. Raquel Gonçalves, Associate Professor, University of Campinas, Brazil
- Roy F. Pellerin, Professor Emeritus, Washington State University, USA.

Local Organizing Committee

- Dr. Claudio Del Menezzi, Associated Professor, University of Brasilia (UnB);
- Dr. Graciela Muniz, Professor, Federal University of Paraná (UFPR);
- Dr. Mario Tomazello, Professor, University of São Paulo (ESALq/USP);
- Dr. Julio Soriano, Assistant Professor, University of Campinas;
- Dr. João Conte, CEO, Brazilian Society for Nondestructive Testing and Evaluation (ABENDI).

Organization/Committee



General Program Schedule

Tuesday, September 22, 2015

7:00 – 18:00	Workshop on Urban Tree Inspection and Standing Timber Assessment - Tijuca National Park (Auditorium Dr. Aldrichi)
19:00 – 20:00	Registration - Windsor Atlantica Hotel (Foyer – first floor)
20:00 – 21:00	Welcome Reception - Windsor Atlantica Hotel (Foyer – first floor)

Wednesday, September 23, 2015 – Windsor Atlantica Hotel

9:00 – 12:00	Registration - Foyer - First Floor
9:00 – 10:00	Opening Ceremony - Room: Paraty B and C - First Floor
10:00 – 10:30	Break and Equipment Exhibition - Angra dos Reis B,C - Second Floor
10:30 – 12:30	General Session: Importance of Nondestructive Evaluation in a Global Forest Products Community - Paraty B and C - First Floor
12:30 – 13:30	Lunch - The View Restaurant (Fourth Floor)
	Concurrent sessions - Second Floor
13:30 – 14:50	Material Characterization (ultrasound) - Room Buzios B
13:30 – 14:50	Evaluation of Solid Sawn Products - Room Angra dos Reis A
13:30 – 14:50	Evaluation of Engineered Wood Products - Room Buzios A
14:50 – 16:30	Poster Session & Equipment Exhibition (Concurrent Coffee Break) - Room: Angra dos Reis B,C
	Concurrent sessions - Second Floor
16:50 – 17:30	Material Characterization (ultrasound) - Room Buzios B
16:50 – 17:50	Evaluation of Solid Sawn Products - Room Angra dos Reis A
16:50 – 18:10	Evaluation of Engineered Wood Products - Room Buzios A
19:30 – 22:30	Tour to Lapa (Optional Program)

Thursday, September 24, 2015 – Windsor Atlantica Hotel

9:00 – 12:00	Registration - Foyer – Second Floor
	Concurrent sessions - Second Floor
9:00 – 11:00	Material Characterization (Infrared and Laser) - Room Buzios B
9:00 – 11:00	Standing Timber Assessment - Room Angra dos Reis A
9:00 – 11:00	In-Place Assessment of Structures - Room Buzios A
11:00 – 12:40	Poster Session & Equipment Exhibition (Concurrent Coffee Break) - Room: Angra dos Reis B,C
12:40 – 13:40	Lunch
	Concurrent sessions - Second Floor
13:40 – 15:00	Material Characterization (Mechanical/Optical/Electrical) - Room Buzios B
13:40 – 15:20	Urban Tree Assessment - Room Angra dos Reis A
13:40 – 15:00	In-Place Assessment of Structures - Room Buzios A
15:20 – 17:30	Poster Session & Equipment Exhibition (Concurrent Coffee Break) - Room: Angra dos Reis B,C
19:30 – 23:30	Conference Dinner - Porcão Rio's Restaurant

Friday, September 25, 2015 – Windsor Atlantica Hotel

9:00 – 12:00	Registration - Foyer - Second Floor
	Concurrent sessions - Second Floor
9:00 – 10:40	Logs and Round Wood Assessment - Room Buzios B
9:00 – 9:40	Standing Timber Assessment - Room Angra dos Reis A
9:40 – 11:00	Evaluation on Solid Sawn Products - Room Angra dos Reis A
9:00 – 10:00	Biomass & Pulpwood Assessment - Room Buzios A
10:00 – 11:40	Material Characterization (Other Techniques) - Room Buzios A
11:40 – 12:40	Snack and Closing
13:00 – 19:00	Tours (Corcovado or Pão de Açúcar) – Optional



Robert J. Ross

Bob Ross has served as a Project Leader for several research work units at the Forest Products Laboratory (FPL) since 1988. Currently his research focuses on the development and use of nondestructive evaluation technologies for various wood products and structures, from standing trees to historic buildings and ships. He has written or co-authored over 250 technical reports/articles about nondestructive evaluation and jointly holds 29 U.S. and foreign patents. He is senior author of four widely referenced books: "Nondestructive Evaluation of Wood"; "Undervalued Hardwoods for Engineered Materials and Components"; "Wood and Timber Condition Assessment Manual"; and "Wood Utilization Options for Urban Trees Infested by Invasive Species". He served as editor of the Centennial Edition of "Wood Handbook-Wood as an Engineering Material", FPL's flagship publication. Bob's research has resulted in the development of innovative nondestructive evaluation methods that are used in laboratory, field, and industrial environments worldwide. His efforts have resulted in domestic and foreign patents that have been or are being commercially developed domestically and off-shore. He has been consulted on a variety of interesting technical projects, including condition assessment of members in USS Constitution (Old Ironsides) and the design of portable floors for one of the leading manufacturers of sports flooring systems in the United States. He has provided input on methods of inspection

for post-hurricane Katrina wood structures and provided information on moisture related performance issues for the laminated propellers of reconnaissance and surveillance drones used by U.S. armed forces.

Bob holds BS (Wood and Fiber Utilization) and MS (Engineering Mechanics) degrees from Michigan Technological University (Michigan Tech) and a PhD in Engineering Science from Washington State University.

Bob's efforts have been recognized by several organizations. Papers summarizing his research results have been formally recognized by the Forest Products Society, Society of Wood Science and Technology, and the Society of Experimental Mechanics. He has received the Federal Laboratory Consortium's Award for Excellence in Technology Transfer, the USDA Forest Service Chief's Award for Excellence in Technology Transfer, and the Fred W. Gottschalk Memorial Award (Forest Products Society) in recognition of outstanding service. He recently was presented the 2014 Felix Ponder Award, USDA Forest Service Northern Research Station and Forest Products Laboratory, in recognition of professional excellence and community service. He is a member of Michigan Tech's School of Forestry and Environmental Sciences' Honor Academy and holds adjunct faculty appointments at the University of Minnesota Duluth, Michigan Tech, Beijing Forestry University, and Northeast Forestry University (Harbin, China). He currently serves as Co-Chair of the International Nondestructive Testing and Evaluation of Wood Symposium Series.

In addition to his technical contributions, Bob has made a significant effort to integrate individuals who have intellectual disabilities into the workplace. His efforts have been formally recognized by the Arc Dane County, Madison Area Rehabilitation Center, and Greater Madison Federal Agency Association. Currently he is a volunteer for the Arc Dane County, WiMar Neighborhood Center in Madison and St. Coletta of Wisconsin.



Raquel Gonçalves

Raquel is currently Professor at the University of Campinas (UNICAMP), Brazil. She holds MS and PhD degrees from the University of São Paulo (USP), Brazil, specializing in wood structures, and has conducted post-doctoral work at Université Laval, Québec, Canada. Raquel currently leads the research group Nondestructive Testing of Wood of the National Research Council of Brazil (CNPq) and of the College of Agricultural Engineering (FEAGRI). She is a contributing member of various technical committees, including those associated with the Brazilian Society of Non-Destructive Testing and Inspection (ABENDI). She works on nondestructive testing standards for grading wood products, and actively works on transferring nondestructive testing technologies.

Raquel coordinates the Nondestructive Testing Laboratory (LabEND) at UNICAMP's College of Agricultural Engineering. She has guided numerous undergraduate, graduate and post-doctoral candidates on the development and use of nondestructive evaluation technologies for wood, structures and standing trees. She has authored or co-authored over 200 articles that have appeared in scientific journals and symposia proceedings. Raquel works closely with a private technology deployment firm in developing ultrasound equipment for use in evaluating wooden poles, wood product grading systems and tree inspection contributing to the technological development of Nondestructive Testing and Evaluation of Wood in Brazil.

Workshop and General session Bios



Adam Senalik

Adam Senalik is a Research General Engineer with the USDA Forest Service, Forest Products Laboratory (FPL). His areas of focus while at FPL have been non-destructive testing of wood, analysis of timber bridge structures, and moisture cycling effects on the strength of wood composites. He is currently involved in evaluating the use of ground penetrating radar as an inspection tool for wood structures. He has written several papers on the subject of wood evaluation and modeling and is a contributor to the Second Edition of Nondestructive Evaluation of Wood distributed at the 19th International Nondestructive Testing and Evaluation of Wood Symposium. He obtained his PhD in the area non-destructive evaluation of wood products from the University of Illinois, Urbana-Champaign. Prior to his PhD, he was a forensic accident investigator specializing in heavy truck collisions.



Bruce Allison

Bruce is an author, educator, researcher and inventor. He is an internationally recognized expert in advanced technology in tree decay detection and tree risk assessment and author of various books on tree history and technical papers on urban forestry tree evaluation.

He holds an undergraduate degree from Brown University and Master of Science and PhD from University of Wisconsin-Madison. He is an Adjunct Professor in the Department of Forest and Wildlife Ecology University of Wisconsin-Madison teaching classes on Sustainable Forestry and also Tree Risk Assessment. In addition he conducts cooperative research on nondestructive testing of standing trees at the USDA Forest Products Laboratory.

His company Allison Tree LLC provides professional tree management consulting and workshops to government agencies, corporations and private clients in the United States and elsewhere. He has been awarded the titles of Board Certified Master Arborist by the International Society of Arboriculture and Registered Consulting Arborist by the American Society of Consulting Arborists.

Workshop and General session Bios



Xiping Wang

Xiping is a Research Forest Products Technologist at the USDA Forest Products Laboratory (FPL), Madison, WI. His work at FPL focuses on nondestructive testing and evaluation of wood, condition assessment of wood structures, and urban tree hazard assessment. He has led and conducted fundamental and applied research in the development of new methodologies and procedures for evaluating wood quality of standing trees and logs, and assessing the structure integrity of historic wood structures. He recently completed an extensive effort focused on developing heat sterilization procedures for wood products infected by invasive species. He has published over 120 research papers, been granted six U.S. and foreign patents, and received the Outstanding Service Award and two Innovations Awards from the University of Minnesota system.

Recently he received the Markwardt Award from the Forest Products Society and the George G. Marra Award from the Society of Wood Science and Technology for distinguished research contributions in the field of wood and fiber science. Xiping received his BS and MS degrees in Mechanical Engineering and Forest Engineering, respectively, from Beijing Forestry University, and a PhD in Wood Science from Michigan Technological University. He is the Associate Editor of the Journal of Materials in Civil Engineering (published by the American Society of Civil Engineers). He also serves as the Research Group Coordinator of IUFRO D5.02 (International Union of Forestry Research Organizations) and holds adjunct faculty appointments at the University of Minnesota Duluth and Beijing Forestry University.



Houjiang Zhang

Houjiang Zhang is a Professor of the School of Technology at Beijing Forestry University (BFU), Beijing, China. His research focuses on non-destructive testing and evaluation of plantation trees, structural lumber, and wood composite panels, and condition assessment of historic wood structures. Houjiang teaches graduate and undergraduate courses on engineering measurement and testing techniques, manufacturing engineering, and CAD/CAM. He has written and co-authored over 90 scientific articles and holds 6 Chinese patents. He is a co-author of the recent Chinese textbook "Wood Structure Building Materials".

Houjiang received his BS in Mechanical Engineering from North China Electric Power University, Beijing, China, MS from Tianjin University, Tianjin, China, and a PhD from Beijing University of Aeronautics & Astronautics, Beijing, China. Houjiang has worked and consulted on inspection and preservation of various historic wood architectures in China, including Ming Dynasty Tombs, Tian'anmen Gate, Temple of Heaven, and Lama Temple etc. He also serves as the Deputy Coordinator of the working party "Non-Destructive Evaluation of Wood and Wood-Based Materials" (D5.02.02) at the International Union of Forestry Research Organizations (IUFRO).



Peter Carter

Peter received a Bachelor of Forestry Science from the University of Canterbury in 1971, and in 1998 graduated with a Masters of Technology Management from the University of Waikato, Technology Management and Innovation Executive Programme.

Now Chief Executive of technology company Fibre-gen, following 36 years of experience with Carter Holt Harvey, Peter has a huge depth of understanding and experience in the development of technology relevant to forest industry needs. He has broad experience from a wide range of technology development projects along the forest growing and processed wood product value chain, and has applied his training and skills to deliver quality technology based outcomes.

His focus on research and development with subsequent commercialisation on acoustic technology resulted from recognition of the opportunity to capture greater value for the tree breeder, forest grower, log producer and log processor, as well as addressing the specific needs of their customers. Peter's support over the past 10 years for programs developing innovative solutions demonstrates a commitment to seek new approaches to meet customer needs. The current development of Hitman tools and incorporation into processor heads continue this commitment.

Detailed Program Schedule

Tuesday, September 22, 2015

Workshop on Urban Tree Inspection and Standing Timber Assessment.

7:00	Bus Departure Windsor Atlantica Hotel
8:30 – 11:30	Lectures Tijuca National Park (Auditorium Dr. Aldrighi) I. Introduction (Dr. Raquel Goncalves, Brazil) II. Basic Nondestructive Testing Techniques (Dr. Robert Ross, USA) III. Tree Physiology (Dr. Bruce Allison, USA) IV. Urban Tree Inspection (Dr. Bruce Allison, USA) V. Standing Timber Assessment (Dr. Xiping Wang, USA) VI. Reference Materials (Dr. Robert Ross, USA)
11h30 – 12:30	Lunch Tijuca National Park (Auditorium Dr. Aldrighi)
12:30 – 15:00	Field Demonstrations Tijuca National Park Instructors: Dr. Xiping Wang , Dr. Bruce Allison , Dr. Raquel Gonçalves
15:00 – 17:00	Tour Tijuca National Park
18:00	Bus Arrive Windsor Atlantica Hotel
19:00 – 20:00	Registration Windsor Atlantica Hotel (Foyer – first floor)
20:00 – 21:00	Welcome Reception Windsor Atlantica Hotel (Foyer – first floor)

Wednesday, September 23, 2015 – Windsor Atlantica Hotel

9:00 – 10:00	Opening of the Symposium (Room: Paraty B and C on First Floor) Welcome to Attendees Dr. Ferenc Divós - Hungary Welcome to Brazil Dr. Claudio Del Menezzi - Brazil Comments from the International Organizing Committee Dr. Francisco Arriaga Martitegui - Spain Comments from Conference Chairs: Dr. Robert J. Ross (USA) and Dr. Raquel Gonçalves (Brazil)
10:00 – 10:30	Coffee Break and Equipment Exhibition (Angra dos Reis B and C on Second Floor)
10:30 – 12:30	General Session: Importance of Nondestructive Evaluation in a Global Forest Products Community (Paraty B and C on First Floor) Moderator: Voichita Bucur, France 10:30 – 10:55 – Timber Assessment – Peter Carter (New Zealand) 10:55 – 11:20 – Wood Structures: Construction and Maintenance – Robert Ross (USA) 11:20 – 11:45 – Historic Preservation of Wood Structures and Artifacts – Houjiang Zhang (China) 11:45 – 12:10 – Response to Natural Disasters – Adam Senalik (USA) 12:10 – 12:30 – Questions and Comments
12:30 – 13:30	Lunch - The View Restaurant (Fourth Floor)
	Concurrent sessions - Second Floor
13:30 – 14:50	ROOM: BÚZIOS B Technical Session: Material Characterization (ultrasound) Moderator: Ferenc Divós, Hungary 13:30 – 13:50 – WS001: Prediction of Young Modulus in Three Orthotropic Directions for Some Important Turkish Wood Species Using Ultrasound - Ergün Güntekin, Turkey 13:50 – 14:10 – WS133: Ultrasound tests for evaluating sensitivity in identify cracks in a piece of Pinus spp – Angela do Valle, Brazil 14:10 – 14:30 – WS 035: African mahogany wood defects detected by ultrasound waves - Tamara Amorim, USA 14:30 – 14:50 – WS005: Ultrasound Transmission Times in Biologically Deteriorated Wood. – Robert Ross, USA

Wednesday, September 23, 2015 – Windsor Atlantica Hotel

13:30 – 14:50	<p>ROOM: ANGRA DOS REIS A Technical Session: Evaluation of Solid Sawn Products Moderator: Türker Dünder, Turkey 13:30 – 13:50 – WS020: Characterization of the Physical and Mechanical Properties of Species, Pino (<i>Pinus Patula</i>) and Tornillo (<i>Cedrelinga Cateniformis</i>) from the Peruvian Forest by using Non Destructives Techniques - Luis Yoza, Peru 13:50 – 14:10 – WS032: Laser based optical nondestructive method for evaluation of the pine timber strength - László Szalai, Hungary 14:10 – 14:30 – WS031: Assessing Southern Pine 2 x 4 Lumber Quality Using a Portable Device - Frederico França, EUA 14:30 – 14:50 – WS137: Evaluation of European beech (<i>Fagus sylvatica</i> L.) roundwood for improved production of strength-graded lamellas - Udo H. Sauter, Germany</p>
13:30 – 15:10	<p>ROOM: BUZIOS A Technical Session: Evaluation of Engineered Wood Products Moderator: Peter Niemz, Switzerland 13:30 – 13:50 – WS023: Nondestructive Evaluation of Laminated Veneer Lumber Composed with High-density Polyethylene – Claudio Del Menezzi, Brazil 13:50 – 14:10 – WS013: Determining Modulus of Elasticity of Full-Size Wood Composite Panels Using a Vibration Method - Cheng Guan, China 14:10 – 14:30 – WS085: Wood-based composite X-ray densitometry – attenuation effects on measurements - Konrad Solbrig, Germany 14:30 – 14:50 – WS046: Non-Destructive Analysis Reveals Effect of Installation Details on Plywood Siding Performance – Xiping Wang, USA 14:50 – 15:10 – WS120: Impact of Wood Grading on the Structural Performance of the Connections of Nailed Laminated Lumber (MLP) Of <i>Pinus</i> spp – NLT- Jorge Moura, Brazil</p>
15:10 – 16:50	<p>POSTER SESSION & Equipment Exhibition (Concurrent Coffee Break) ROOM: ANGRA DOS REIS B AND C ON SECOND FLOOR Moderator: Claudio Del Menezzi, Brazil WS058 - Velocity variation in wood as a function of defects – Mariana Guerra, Brazil WS053 - Variation on acoustic properties of Eucalyptus clones with age - Gabriela Müller, Brazil WS091 - Structural grading of timber using the modulus of elasticity obtained by longitudinal stress wave method – Jairo de Andrade Jr., Brazil WS098 - Preservative treatment effect on the velocity propagation of ultrasonic and stress waves in three tropical hardwoods – Ricardo Teles, Brazil WS015 - Condition Assessment of a Historic Trout Rearing Station – Frederico França, USA WS019 - Wear Behavior of Drill Bit and Its Blunting Effect on Force Parameters in Drilling Resistance Measurement on Wood - Evgenii Sharapov, Russia WS102 - Wood Defects Analysis of <i>Pinus</i> Boards Using Digital Image Processing and Artificial Neural Networks – Adriano Ballarin, Brazil WS038 - Investigation of Stress Wave Velocity Perpendicular to Grain in Softwoods and Hardwoods Grown in Estonia – Marko Teder, Estonia WS045 - Assessment of biomass for energy industry in Arauco Forest Company - Simón Sandoval, Chile WS084 - Early age evaluation by the stress wave speed for the breeding of high Young's modulus Japanese cedar - Kiyohiko Ikeda, Japan WS086 - Nondestructive evaluation of coconut palm wood by means of ultrasonic and natural frequency methods - Konrad Solbrig, Germany WS016 - Determination of the Mechanical Properties of <i>Castanea Sativa</i> Mill. using Ultrasonic Wave Propagation and Comparison with Static Compression and Bending Methods – Manuel Guaita Fernandez, Spain WS117 - NIR spectroscopy calibrations for estimating carbon content in Eucalyptus wood, roots and leaves – Maíra de Assis, France</p>
	Concurrent sessions - Second Floor
16:50 – 17:30	<p>ROOM: BÚZIOS B Technical Session: Material Characterization (ultrasound) Moderator: Francisco Arriaga, Spain 16:50 – 17:10 – WS057: Monitoring of wood Degradation caused by Fungi using ultrasonic tomography – Mariana Guerra, Brazil 17:10 – 17:30 – WS081: Ultrasonic testing with different orientations throughout cross section of <i>Eucalyptus grandis</i> – Angela do Valle, Brazil</p>
16:50 – 17:50	<p>ROOM: ANGRA DOS REIS A Technical Session: Evaluation of Solid Sawn Products Moderator: Voichita Bucur, France 16:50 – 17:10 – WS033: Strength grading based on high resolution laser scanning – performance of a procedure newly approved for the European market – Anders Olsson, Sweden 17:10 – 17:30 – WS037: Acoustic Velocity as Predictor of Strength Properties in Softwoods and Hardwoods Grown in Estonia – Marko Teder, Estonia 17:30 – 17:50 – WS042: Influence of the moon phase on stress wave velocity and structural timber properties - Guillermo Íñiguez, Spain</p>
16:50 – 18:50	<p>ROOM: BUZIOS A Technical Session: Evaluation of Engineered Wood Products Moderator: Yann Benoit, Switzerland 16:50 – 17:10 – WS157: Comprehensive study on measuring elastic constants of engineered wood-based panels by modal testing with different boundary conditions - Jianhui Zhou, Canada 17:10 – 17:30 – WS114: Impact of grading on the mechanical behavior of CLT panels made from low quality timber - Juliana Bello Mussi Alencar, Brazil 17:30 – 17:50 – WS087: Effect of wood properties and production process on stiffness of charcoal studied by ultrasonic technique - Maíra Reis de Assis, Brazil 17:50 – 18:10 – WS003: Predicting Plywood Properties with Wood-Based Composite Models - Robert Ross, USA</p>
19:30	Bus departure from Windsor Atlantica Hotel to Lapa (Optional Activity)
22:30	Bus departure from Lapa to Windsor Atlantica Hotel

Thursday, September 24, 2015 – Windsor Atlantica Hotel

	Concurrent sessions - Second Floor
9:00 – 11:00	<p>ROOM: BÚZIOS B Technical Session: Material Characterization (Infrared and Laser) Moderator: Mario Tomazello, Brazil 9:00 – 9:20 – WS039: An Application of 3D Fiber Angles Identified through Laser Scanning based on Tracheid Effect - Min Hu, Sweden 9:20 – 9:40 – WS029: Three dimensional knot models based on surface laser scanning - Andreas Briggert, Sweden 9:40 – 10:00 – WS068: Surface Defect Detection in Solid Wood using Infrared Techniques – Roberto Aedo, Chile 10:00 – 10:20 – WS070: Near infrared laser reflection based wood moisture content determination - Ferenc Divos, Hungary 10:20 – 10:40 – WS103: Chemistry of Wood in 3D: New Infrared Imaging - Barbara Illman, USA 10:40 – 11:00 – WS021: Application of Infrared Spectroscopy and Thermogravimetric Analysis in the screening of disease tolerant Pinus taeda (Loblolly Pine) Families for Chemistry, Strength and Bioenergy - Gifty Acquah, USA</p>
9:00 – 11:00	<p>ROOM: ANGRA DOS REIS A Technical Session: Standing Timber Assessment Moderator: Peter Carter, New Zealand 9:00 – 9:20 – WS017: Acoustic Evaluation of Thinning and Bio-solid Fertilization Effects on Wood Quality of a Douglas-fir Stand - Xiping Wang, USA 9:20 – 9:40 – WS027: Comparing usefulness of acoustic measurements on standing trees for segregation by timber stiffness – David Gil-Moreno, United Kingdom 9:40 – 10:00 – WS047: 10 years of experience using NIR in Arauco: Since model development until their operational use in Eucalyptus sp. breeding program and commercial plantations assessment – Miguel Peredo, Chile 10:00 – 10:20 – WS049: Prediction of the velocity in logs and beams from the velocity in standing trees - Cinthya Bertoldo, Brazil 10:20 – 10:40 – WS050: Prediction of strength and stiffness of wood in bending using adjusted ultrasound velocities in standing trees – Raquel Gonçalves, Brazil 10:40 – 11:00 – WS082: Measures of Crystallinity as a Non-Destructive Indicator of Wood Hardness: Study on young fast grown plantation teak planted in dry and wet sites - Ratih Damayanti, Australia</p>
9:00 – 11:00	<p>ROOM: BUZIOS A Technical Session: In-Place Assessment of Structures Moderator: Adriano Ballarin, Brazil 9:00 – 9:20 – WS002: In-situ Synchrotron micro-tomography and acoustic emission of Norway spruce samples under tensile load – Peter Niemz, Switzerland 9:20 – 9:40 – WS044: Influence of the sensors placement in the in-situ measurement of the ultrasonic wave velocity - Francisco Arriaga, Spain 9:40 – 10:00 – WS063: NDT to identify biological damage in wood - Roberto Martínez, Spain 10:00 – 10:20 – WS073: Glue laminated timber structure evaluation by acoustic tomography – Laszlo Bejo, Hungary 10:20 – 10:40 – WS138: Assessing the Performance in Service of an Cross Laminated Timber Structure Exposed to Extreme Conditions - Luís Jorge, Portugal 10:40 – 11:00 – WS142: New generation of non-destructive tool for in-field wood poles using combined parameters for improved reliability - Yann Benoit, Switzerland</p>
11:00 – 12:40	<p>POSTER SESSION & Equipment Exhibition (Concurrent Coffee Break) ROOM: ANGRA DOS REIS B AND C ON SECOND FLOOR Moderator: Claudio Del Menezzi, Brazil WS051 - Ultrasound as a tool in defining the use potential of crossarms manufactured with recycled wood – Raquel Gonçalves, Brazil WS140 - Mechanical properties of structural wood used in coal mines by traditional testing and non-destructive testing – Cesar Polanco-Tápia, Brazil WS054 - Evolution of properties, from planting to cutting age, obtained by nondestructive testing in Eucalyptus clones – Douglas Moraes, Brazil WS056 - Monitoring of wood Degradation caused by termites using ultrasonic tomography – Stella Stopa Assis Palma, Brazil WS101 - Eucalyptus wood phenotyping by near infrared spectroscopy - Gilles Chaix, Brazil WS151 - Plant health evaluation and fall risk in Tilia tomentosa in the town of Amarante, Portugal – Aderbal Gomes da Silva, Brazil WS158 - New Empirical Production Models for Poplar Plantations on Farmland - A toolbox for improved management and planning operations - Birger Hjelm, Sweden WS160 - Measurement of stiffness of standing tress using acoustic velocity measurements made through tree stems - Mathew Legg, New Zealand WS154 - Additional Variables with Acoustic Velocity to Predict Structural Lumber Quality Obtained from the Trees and Logs in Eucalyptus globulus Labill - Esther Merlo, Spain WS080 - Modulus of elasticity in transverse vibration of some growing woods in Chile – Erik Baradit, Chile WS090 - Eucalyptus Wood Evaluation by NDT Assessment – Graziela Vidaurre, Brazil WS094 - Detecting defects in standing trees by an acoustic wave tomography with pseudorandom binary sequence code: Effect of frequency - Toshihiro Yamada, Japan WS121 - Structural segregation of lumber boards for CLT panels through transverse vibration testing – Alexander Opazo, Chile WS111 - Effect of One-side Thermomechanical Treatment on the Stress Wave Velocity and Dynamic MOE of a Tropical Wood – Ana Freitas, Brazil</p>
12:40 – 13:40	Lunch - The View Restaurant (Fourth Floor)

Thursday, September 24, 2015 – Windsor Atlantica Hotel

	Concurrent sessions - Second Floor
13:40 – 15:00	<p>ROOM: BÚZIOS B Technical Session: Material Characterization (Mechanical/Optical/Electrical) Moderator: Ignacio Bobadilla, Spain 13:40 – 14:00 – WS066: Surface Roughness Determination in some Wood Boards using Speckle Interferometry - Erik Baradit, Chile 14:00 – 14:20 – WS059: Modulus of Elasticity and Rebound Coefficient Correlated for tropical species - Julio Soriano, Brazil 14:20 – 14:40 – WS036: Development of an automated portable tester for evaluating dynamic hardness of the wood - Adriano Ballarin, Brazil 14:40 – 15:00 – WS071: Detecting beech red heart by electrical resistance measurement – Laszlo Bejo, Hungary</p>
13:40 – 15:20	<p>ROOM: ANGRA DOS REIS A Technical Session: Urban Tree Assessment Moderator: Sergio Brazolin, Brazil and Bruce Allison, USA 13:40 – 14:00 – WS145: Biodeterioration and hazard assessment of Tipuana trees in the sidewalks of São Paulo, SP- Sérgio Brazolin, Brazil 14:00 – 14:20 – WS095: Detecting defects in standing trees by an acoustic wave tomography with pseudorandom binary sequence code: Simulation of defects using artificial cavity - Kana Yamashita, Japan 14:20 – 14:40 – WS072: Evaluation of the root system's stability based on actual wind intensity and inclination measurements - Ferenc Divos, Hungary 14:40 – 15:00 – WS110: Development of an inexpensive field and research tool for acoustic testing of tree decay – Bruce Allison, USA 15:00 – 15:20 – WS118: Mobile Unity Forestry for hazard assessment of urban trees in Bogota – Yolima Cortés-Cortés, Colombia</p>
13:40 – 15:00	<p>ROOM: BUZIOS A Technical Session: In-Place Assessment of Structures Moderator: Udo Sauter, Germany 13:40 – 14:00 – WS127: Near infrared spectroscopy in wooden floor: application for wood discrimination and air-dry density estimation - Raphael Pigozzo, Brazil 14:00 – 14:20 – WS089: Feasibility study on retrospective reconstruction method with X-ray radiographs to investigate inner state of wood - Chul-Ki Kim, Korea 14:20 – 14:40 – WS119: Design and experimental analysis of the trussed rafter system using nailed laminated softwood timber (NLT)-Impact of grading on the structural performance. Jorge Moura, Brazil 14:40 – 15:00 – WS099: Non-destructive Evaluation of Wood Using Thermal Conductivity and a Case Study in Kastamonu/ Turkey – Mustafa Korkmaz, Turkey</p>
15:20 – 17:30	<p>POSTER SESSION & Equipment Exhibition (Concurrent Coffee Break) ROOM: ANGRA DOS REIS B AND C ON SECOND FLOOR Moderator: Claudio Del Menezzi, Brazil WS012 - Stress wave propagation in Larch plantation trees—Experimental Validation, Houjiang Zhang, China WS150 - Density profile evaluation of laminated wood beams bonded through Resistograph – Vinnicius Pizzol, Brazil WS060 - Influence of drying defects in the velocity of ultrasonic waves and in the compression strength of wood – Nadia Veiga, Brazil WS097 - Digital X-ray Images Applied in Characterization Physics and Anatomical of Pinus caribaea var. hondurensis Wood– Vinnicius Castro, Brazil WS124 - Wood colorimetric characteristics of Cordia americana, Melia azedarach and Parapiptadenia rigida by the CIEL*a*b* method – Sabrina Finatto, Brazil WS126 - Effects of nonlinearity and variability in the study of natural frequency of Eucalyptus grandis wood using a impulse excitation nondestructive technique – Carlos A Matos, Brazil WS134 - Module evaluation of dynamic elasticity, determined by ultrasound, in three species of tropical wood – Joaquim Gonçalez, Brazil WS136 - Methods for Nondestructive Investigation of Heritage Listed Timber Buildings to Support Restoration Projects and Preservation Initiatives – Gabriel Ruiz de Oliveira, Brazil WS162 - Study on Termites Detection using Two-frequency CW Radar System - Dan Zhang, China WS141 - Evaluation of moisture content in green solid wood using dual-energy X-ray absorptiometry with digital radiograph - Hyeon-Jeong Lee, Korea WS161 - Experimental measurement of acoustic guided wave propagation in logs - Mathew Legg, New Zealand WS022 - Nondestructive prediction of the chemical and thermal reactivity properties of forest biomass using vibrational spectroscopy and thermogravimetric analysis - Gifty Acquah, USA WS153 - Eucalyptus grandis of Ten Years Old by Impulse Excitation Technique – Elen Moraes, Brazil</p>
19:30	Bus Departure from Hotel (Windsor Atlantica)
20:00 – 23:30	Conference Dinner - Porcão Rio's Restaurant

Friday, September 25, 2015 – Windsor Atlantica Hotel

	Concurrent sessions - Second Floor
9:00 – 10:40	<p>ROOM: BÚZIOS B Technical Session: Logs and Round Wood Assessment Moderator: Guillermo Íñiguez, Spain 9:00 – 9:20 – WS008: Analyzing the Accuracy of Internal Hardwood Log Defect Prediction Equations – R. Edward Thomas, USA 9:20 – 9:40 – WS116: Automated wood species identification by CT-technology - Udo Sauter, Germany 9:40 – 10:00 – WS052: Influence of the diameter on the ultrasound waves velocity in Round timber - Monica Ruy, Brazil 10:00 – 10:20 – WS014: Development of a Nondestructive Testing Technique to Quantify Marine Borer Damage -Observations from a Pilot Study with Sitka Spruce and Western Hemlock Logs – Robert Ross, USA 10:20 – 10:40 – WS146: Two dimensional image construction of ultrasonic wave for detecting internal hole defect in log disc - Huadong Xu, China</p>
9:00 – 9:40	<p>ROOM: ANGRA DOS REIS A Technical Session: Standing Timber Assessment Moderator: Bruce Allison, USA 9:00 – 9:20 – WS011: Stress Wave Propagation in Larch Plantation Trees—Numerical Simulation - Fenglu Liu, China 9:20 – 9:40 – WS148: Efficiency of Acoustic Segregation of Castanea sativa Standing Trees and Logs for Structural Timber Production - Oscar Santaclara, Spain</p>
9:40 – 11:00	<p>ROOM: ANGRA DOS REIS A Technical Session: Evaluation on Solid Sawn Products Moderator: Julio Soriano, Brazil 9:40 – 10:00 – WS109: Grading of Paricá Wood for Structural Purposes – Cleide Beatriz Bourscheid, Brazil 10:00 – 10:20 – WS079: Strength Grading of Turkish Black Pine (Pinus nigra var. pallasiana Arnold.) Structural Timber by Visual Evaluation and Nondestructive Testing - Türker Dündar, Turkey 10:20 – 10:40 – WS064: Use of visual and mechanical variables for structural grading of Pine from Uruguayan plantations - Andrea Cardoso, Uruguay 10:40 – 11:00 – WS108: Nondestructive Classification of Parica Timber for Beams Production in Glulam – Rodrigo Terezo, Brazil</p>
9:00 – 10:00	<p>ROOM: BUZIOS A Technical Session: Biomass & Pulpwood Assessment Moderator: Ignacio Bobadilla, Spain 9:00 – 9:20 – WS010: Assessing Specific Gravity of Young Eucalyptus Plantation Trees Using a Resistance Micro-Drilling Technique - José Tarcísio Oliveira, Brazil 9:20 – 9:40 – WS055: Prediction of basic specific gravity using parameters measured on trees – Raquel Gonçalves, Brazil 9:40 – 10:00 – WS159: Application of X-Ray Densitometry in the Evaluation of Quality and Mechanical Properties of Biomass Pellets – Roger Moya, Costa Rica</p>
10:00 – 11:40	<p>ROOM: BUZIOS A Technical Session: Material Characterization (Other Techniques) Moderator: Erik Baradit, Chile 10:00 – 10:20 – WS024: Mechanical and Physical Properties of Wood and Bamboo in Cell Wall Level: Our Recent Progress – Sigun Wang, USA 10:20 – 10:40 – WS030: Use of the attenuation gamma radiation technique for qualification of heartwood and sapwood in Eucalyptus – Adriano Wagner Ballarin, Brazil 10:40 – 11:00 – WS143: Nondestructive testing of string musical instruments made in solid wood - Voichita Bucur, France 11:00 – 11:20 – WS048: Effect of moisture content in nondestructive probing measurements - Daniel F. Llana, Spain 11:20 – 11:40 – WS144: Wood density measurement by microwave radar – Ferenc Divos, Hungary</p>
11:40 – 12:40	Snack and Closing
13:00	Bus Departure to Optional Tours Windsor Atlantica Hotel
13:00 – 19:00	Optional Tours to Pão de Açúcar and Corcovado

Exhibitors



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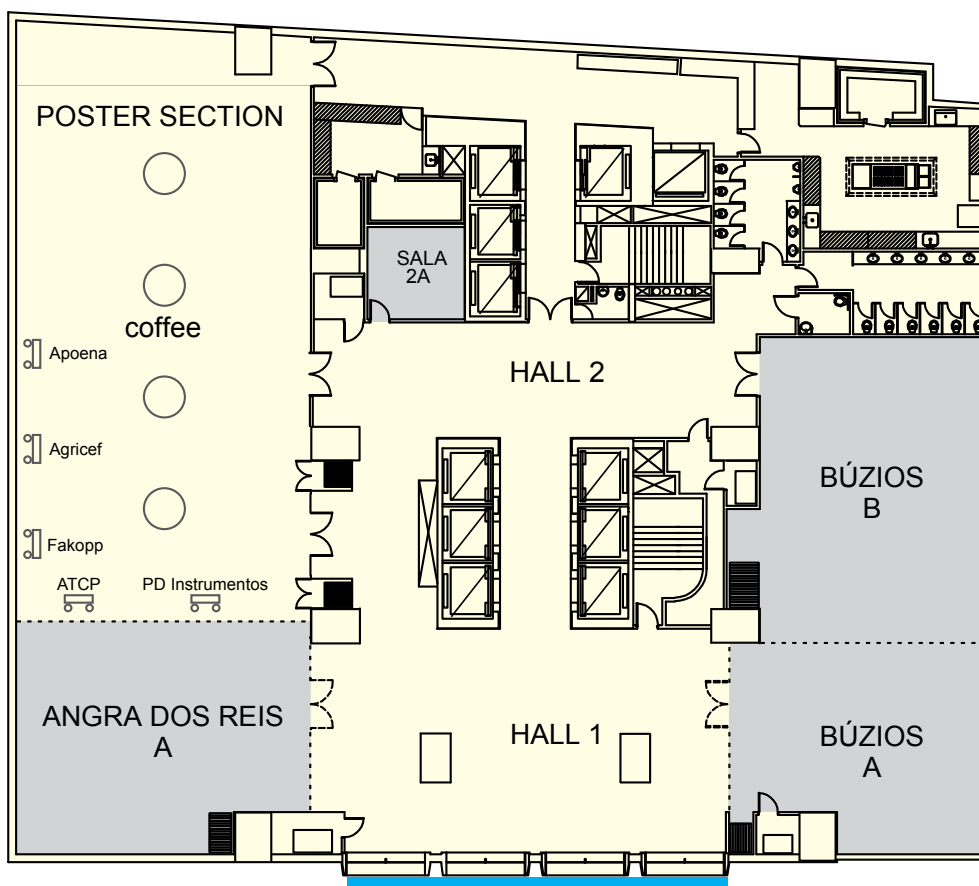


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Floor Plant - Second Floor





19th International Nondestructive Testing and Evaluation of Wood Symposium

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