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Dr. Stavros Avramidis

Professor

Research Interests: [wood physics and drying](#)

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Research Areas:

- Wood-water relations and sorption thermodynamics
- Momentum, heat and mass transfer in wood
- Modeling steady-state and dynamic non-isothermal diffusion in wood
- Application of fractals and artificial neural networks to wood properties modeling
- Modeling drying stresses in wood and their effect on quality
- Industrial wood kiln drying optimization and development of new drying strategies
- Radio frequency vacuum (RFV) heating and drying of wood and wood products

Research Areas

Wood physics

Wood drying

Non-destructive evaluation

Wood and energy

Projects

Modeling of wood thermo-sorptive behavior with artificial neural networks.

Development of timber drying quality prediction models.

Modeling drying stresses in timbers and logs.

Development of new methods to increase wood permeability.

Evaluation of post-drying treatments on timber quality.

RFV drying and heating of wood and wood products.

RF phytosanitation of wood

<http://www.forestry.ubc.ca/2013/06/tune-in-to-clean-wood/>

NDE evaluation of wet-pockets in hemlock using NIR technology

Superheated steam drying of western hemlock

Unit Associations

[Centre for Advanced Wood Processing CAWP](#)

Professional Affiliations

American Society for Testing and Materials ASTM

[Fellow International Academy of Wood Science IAWS](#)

[Fellow, The Institute of Materials, Minerals and Mines](#)

[Forest Products Society FPS](#)

International Association of Wood Anatomists

Registered Professional Forester (EU)

[Society of Wood Science and Technology](#)

Current Graduate Students

Mr. Mahdi Shahverdi, PhD

Wood drying modeling

Ms. Jingbo Shi, PhD

Modeling sorption hysteresis

Current Courses

Winter 2013

WOOD282 Wood Physics and Drying [Sections](#)

Wood-moisture relationships, transport phenomena, acoustical and electrical properties of wood; wood drying methods.

Winter 2013

WOOD244 Quantitative Methods in the Wood Industry [Sections](#)

Solving practical problems in the wood industry using computer-based mathematical tools including spreadsheets,

Wood sorption theories and thermodynamics, hygroexpansion; Darcian and non-Darcian flow of fluids in wood; coupled heat and moisture transfer; electrical and acoustical properties of wood.

Selected Publications

Iliadis, L., Tachos, S., Avramidis, S., Mansfield, S.D. (2013). **Hybrid e-Regression and validation soft computing techniques: the case of wood dielectric loss factor.** *Neurocomputing*. 107:33–39.

Lazarescu, C. and S. Avramidis (2012). **Heating characteristics of western hemlock in a high frequency field.** *European Journal of Wood and Wood Products*, 70: 489-496

Lazarescu, C., Bedeleian, B. and Avramidis S. (2012). **Heating characteristics of softwoods in a high frequency field** *ProLigno*, 8(4): 18-26.

Tekleyohannes, AT and S. Avramidis (2012). **Two-level System Dynamical Coarse-1 graining of Annual Rings -** *Wood Science and Technology*, 46(1-2): 473-485

Abubakari, A., Avramidis, S. and L. Oliveira (2012). **Impact of radio frequency heating pre-treatment on the kiln drying characteristics of sub-Alpine fir** *Journal of Wood and Wood Products*, 70: 245-251

Watanabe, K., Mansfield, S. and S. Avramidis (2012). **Wet-pocket classification in *Abies lasiocarpa* using visible and near infrared spectroscopy** *European Journal of Wood and Wood Products*, 70: 61-67

Watanabe, K., Lazarescu, Shida, S. and S. Avramidis. (2012). **A novel method of measuring moisture content distribution in timber during drying using CT scanning and image processing techniques** *Drying Technology* 30 (2): 256-262.

Hernandez, V., Avramidis, S. and Navarrete, J. (2012). **Albino strains of *Ophiostoma* spp. fungi effect on radiata pine permeability** *European Journal of Wood and Wood Products*, 70: 551-556.

Watanabe, K., Mansfield, S. D. and Avramidis, S. (2012). **Wet-pocket classification in *Abies lasiocarpa* using visible and near infrared (Vis-NIR) spectroscopy** *European Journal of Wood and Wood Products*. 70:61-67.

Torres, S.S., Jomaa, W, Puiggali, J-R., and S. Avramidis (2011). **Multiphysics modeling of vacuum drying of wood.** *Applied Mathematical Modeling Journal*, 35(20): 5006-5016

Lazarescu, C., Dale, A., Uzunovic, A., Breuil, C. and S. Avramidis (2011). **Radio frequency heating pasteurization of pinewood nematode infected wood** -*European Journal of Wood and Wood Products*. 69: 573-578

Lazarescu, C., Dale, A., Uzunovic, A., Breuil, C. and S. Avramidis (2011). **Radio frequency heating pasteurization of pinewood nematode infected wood.** *European Journal of Wood Products*, 70:245-251

Watanabe, K., Abubakari, A., Lazarescu, C. and S. Avramidis (2011). **Softwood heating in radio frequency fields.** *European Journal of Wood and Wood Products*, 69: 295-301

Mansfield, S., Kang ,K-Y., Iliadis, L., Tachos, S., and S. Avramidis (2011). **Strength Prediction in Populus spp. Clones using Artificial Neural Networks and epsilon-regression Support Vector Machines** *-Holzforschung*, 65: 855-863

Lazarescu, C. and S. Avramidis (2011). **Radio frequency heating kinetics of softwood logs** *-Drying Technology* 29 (6): 673-681

Zhan, J and S. Avramidis (2011). **Mechano-sorptive creep of hemlock under conventional drying: I. The determination of free shrinkage strain** *-Drying Technology* 29(7): 789-796

Zhan, J and S. Avramidis (2011). **Mechano-sorptive creep of hemlock under conventional drying: II. Description of actual creep behavior in drying lumber** *-Drying Technology* 29(10): 1140-1149

Watanabe, K., Hart, J.F., Mansfield, S.D. and S. Avramidis (2010). **Near-infrared technology applications for quality control in wood processing.** *-In proceedings of COST Action E53 Conference, Edinburgh, UK*

Watanabe, K., Hart, F., Mansfield, S.D. and Avramidis, S. (2010). **Detection of wet-pockets on the surface of Tsuga heterophylla (Raf.) Sarg. by near infrared (NIR) spectroscopy** *Holzforschung* 64:55-60

Lazarescu, C., Watanabe, K. and S. Avramidis (2010). **Density and Moisture Profile Evolution during Timber Drying by CT-Scanning Measurements.** *-Drying Technology*, 28(4): 460-467

Tekleyohannes, A, and S. Avramidis (2010). **Two-level self-organization of wood properties: a new paradigm for dimensional analysis and scaling.** *-Wood Science and Technology*, 44: 253-268

Tanaka, T., Avramidis, S. and S. Shida. (2010). **A Preliminary Study on Ultrasonic Treatment Effect on Transverse Wood Permeability.** *-MADERAS Scientia y tecnologia*, 12(1): 3-9

Lazarescu, C., Avramidis, S. and L. Oliveira (2010). **Modeling Shrinkage Response to Tensile Stresses in Wood Drying II. Stress – Shrinkage Correlation in Restrained Specimens.** *-Drying Technology*, 28(2): 196-102

Lazarescu, C., Avramidis, S. and L. Oliveira (2010). **Shrinkage Response to Tensile Stresses in Wood Drying III**

Lazarescu, C., Avramidis, S. and L. Oliveira (2010). **Shrinkage Response to Tensile Stresses in Wood Drying III. Stress-Tensile Set Correlation in Short Pieces of Lumber** -*Drying Technology*, 28(6): 745-751

Elustondo, D., Oliveira, L and S. Avramidis (2010). **New Methodology to Optimize Sorting in Wood Drying.** - *MADERAS*, 12(2): 79-91

Elustondo, D., Oliveira, L. and S. Avramidis. (2010). **New Methodology to Optimize Sorting in Wood Drying** -*In proceedings of the 11th International IUFRO Conference on Wood Drying, Skelleftea, Sweden, January 2010.* 208-215

Lazarescu, C., Avramidis, S. and L. Oliveira. (2010). **Shrinkage response to tensile stresses during hemlock (Tsuga heterophylla) drying** -*In proceedings of the 11th International IUFRO Conference on Wood Drying, Skelleftea, Sweden, January 2010,* 122-130.

Watanabe, K., Son, E., Lazarescu, C., Breuil, C. and S. Avramidis (2010). **Radio Frequency Heating for Green Wood Phytosanitation** -*In proceedings of the 11th International IUFRO Conference on Wood Drying, Skelleftea, Sweden, January 2010,* 307-312.

Tanaka, T., Avramidis, S., Shida, S (2009). **Evaluation of Moisture Content Distribution in Wood by Soft X-ray Imaging** -*Wood Science Journal*, 55: 69-73.

Lazarescu, C., Plattner, A., Hart, F., Breuil, C., and S. Avramidis (2009). **Pasteurization of Hemlock by Radio Frequency Heating: a preliminary study** -*Forest Products Journal*, 59(4):79-83

Elustondo, D., Avramidis, S. and R. H. Keery (2009). **RFV drying schedule development for western red cedar timbers** -*Journal of the Institute of Wood Science*, 18(2):68-74.

Lazarescu, C. and S. Avramidis (2008). **Drying Related Strain Development in Restrained Wood** -*Drying Technology*, 26(5): 544-551

Watanabe, K., Saito, Y., Avramidis, S. and S Shida (2008). **Non-destructive measurement of moisture distribution in wood during drying using digital X-ray microscopy** -*Drying Technology*, 26(5): 590-595

Rayirath, P., Avramidis, A., Mansfield, S. D. (2008). **The effect of wood drying on crystallinity and microfibril angle in black spruce (Picea mariana)** *Journal of Wood Chemistry and Technology*. 28: 167-179.

Rayirath, P., Avramidis, S. (2008). **Some aspects of western hemlock air permeability** -*MADERAS: Ciencia y Tecnologia*, 10(3): 185-193

Hart, F., Avramidis, S. and S.D. Mansfield (2008). **Detection of Wet-pockets in Hemlock Using Near Infrared**

Lazarescu, C., and S. Avramidis (2007). **Evaluation of Hygrothermal Shrinkage Strain in Tsuga heterophylla.**

Lazarescu, C. and S. Avramidis (2007). **Drying stress development patterns in restarined wood** -IUFRO Wood Drying Conference, Bangor, Maine, 44-49.

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Avramidis, S. and H. Wu (2007). **Artificial neural network and mathematical modeling comparative analysis of nonisothermal diffusion of moisture in wood** -*Holz als Roh und Werkstoff, 65: 89-93*

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Bradic, S. and S. Avramidis (2007). **Impact of Juvenile Wood on Hemlock Timber Drying Characteristics** -*Forest Products Journal, 57(1/2): 53-59*

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Avramidis, S. and B. Hao (2005). **Industrial scale moisture class assessment of Pacific coast hemlock kild drying.** -*UBC-Wood Science report to the Coastal Forest and Lumber Association and the ZAIRA Lumber Partnership, Vancouver, BC. 25pp.*

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Parfit, L.J., Hartley, I.D. and S. Avramidis (2005). **Acoustic constant property of interior spruce (Picea spp.) from the central interior of British Columbia** -*Forest Products Journal*, 55(9):74-76

Avramidis, S. and L. Iliadis (2005). **Predicting wood thermal conductivity using Artificial Neural Networks.** - *Wood and Fiber Science*, 37(4): 682-690.

Avramidis, S., Shida, S., Koumoutsakos, A. and D. Kobayashi (2005). **Stability study of square timbers in simulated house frame service in Japan.** - *Forest Products Journal*, 55(10): 84-91

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Avramidis, S., J. Aune, and L. Oliveira (2004). **Exploring pre-sorting and re-drying strategies for pacific coast hemlock square timbers.** *Journal of the Institute of Wood Science*, 16(4): 189-198

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Avramidis, S. and B. Hao (2003). **AUTOMATED LUMBER SORTING FOR STABILITY (ALSOS): Effect of Slope of Grain and Annual Ring Orientation on the Drying Characteristics of Hemlock Baby Squares** UBC-Wood Science report to the Coastal Forest and Lumber Association and the ZAIRAI Lumber Partnership, Vancouver, BC. 27pp.

Elustondo, D. and S. Avramidis (2003). **Simulated comparative analysis of sorting strategies for RFV drying.** *Wood and Fiber Science*, 35(1): 49-55

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Koumoutsakos, A. and S. Avramidis (2003). **Mass transfer characteristics of western hemlock and western red**

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