

Monday, May 11, 2009

08:30 — 08:50

Opening Session

R1

08:50 — 09:30

Keynote Session I

Chairperson: Karin Hofstetter

R1

08:50	Lennart Salmén: The cell wall microstructure - where do we stand and what is needed?	17
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09:30 — 10:30

Session I - Microstructural Investigations by X-ray and CT (WG1)

Chairperson: Stefanie Tschegg

R1

ORAL

09:30	Jonas Danvind, Fredrik Forsberg, Rene Mooser, Erwin Hack, and Peter Wyss: An example on acquiring wood ultra-structure, density and strain in 3D using non-destructive Synchrotron Radiation Micro Computed Tomography and Digital Volume Correlation	19
09:50	Marco Fioravanti and Nicola Sodini: Studies on the measurement of micro density variation in wood by means of X-ray micro CT	21

POSTER

10:10	David Mannes, Daniel Keunecke, Federica Marone, Marco Stampanoni, Eberhard Lehmann, and Peter Niemz: Tomographic wood microscopy based on Synchrotron radiation	23
10:13	J. Van den Bulcke, M. Boone, J. Van Acker, J. Vlassenbroeck, Y. De Witte, and L. Van Hoorebeke: The use of X-ray CT for wood analysis	25
10:16	Kirsi Leppänen, M. Peura, K. Pirkkalainen, Ingela Bjurhager, and Ritva Serimaa: X-ray scattering study on the structure and dynamics of never-dried Silver birch and green European aspen	27
10:19	Mario Zauer and Alexander Pfriem: Investigation of the pore structure of wood using nitrogen pycnometry and mercury intrusion porosimetry	29
10:21	Lidia Gurau, Marina Cionca, Cristina Timar, and Alin Olarescu: Branch wood. Mechanical strength and microscopy as relate to stem wood	31
10:24	Julia Schreiber, Peer Haller, and Uwe Hampel: Measurement of the density distribution in wood using X-ray tomography	33
10:27	Ksenija Radotic, Daniela Djikanovic, Jasna Simonovic, Dragosav Mutavdzic, Jelena Bogdanovic, Milorad Jeremic, Goran Brankovic, Danijela Lukovic Golic, and Branko Matovic: Study of the cell wall structure in a conifer and a weed species, using X ray diffraction and fluorescence spectroscopy	43

10:30

COFFEE BREAK

R2

11:00 — 12:40**Session II - Cell Wall Microstructure (WG1)**

Chairperson: Stefanie Tschegg

R1

ORAL

11:00	Stig L. Bardage: Some aspects of wood and fiber microstructure in softwoods	35
11:20	Jasna Stevanic and Lennart Salmén: On the orientation of the wood polymers in spruce wood fibres	37
11:40	Anwasha Fernandes, Clemens Altaner, and Michael Jarvis: Disordered cross-linking of microfibrils in spruce wood: a model for high-performance biomaterials	39
12:00	Cedric Montero, Bruno Clair, and A. Van der Lee: Nanostructural investigations of cellulose deformation by X-ray diffraction	41

12:20

LUNCH

R4

14:00 — 14:40**Keynote Session II**

Chairperson: Michaela Eder

R1

14:00	Ingo Burgert: Wood micromechanics - actual state and perspectives	45
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14:40 — 16:00**Session III - Structure and Behaviour of Altered Wood (WG1+2+3)**

Chairperson: Uwe Schmitt

R1

ORAL

14:40	Lisbeth G. Thygesen, Emil Tang Engelund, and Preben Hoffmeyer: Sorption isotherms of untreated, acetylated and furfurylated wood at high values of relative humidity (92-99.9 %)	47
15:00	Ilona Peszlen, Balasz Horvath, Perry Peralta, Bohumil Kasal, and Laigeng Li: Anatomical structure of transgenic aspen trees	49
15:20	Ingela Bjurhager, Jonas Ljungdahl, Lennart Wallström, Kristofer Gamstedt, and Lars A. Berglund: Effects of polyethylene glycol treatment on the mechanical properties of oak - A model study for better understanding of the Vasa ship	51

POSTER	15:40	Dieter Loidl and Stefanie Stanzl-Tschegg: Influence of the thermal treatment of wood on the mechanical parameters at macroscopic and nanoscopic length scale	53
	15:43	Rahime Bag, Bernard Kurek, Johnny Beaugrand, and Patrice Dole: Viscoelastic properties of cell wall in situ polymers from woody hemp core (chênevotte)	55
	15:46	Bo Zhang, Michaela Eder, Björn Sundberg, and Ingo Burgert: Mechanical properties of genetically modified poplar cell walls	57
	15:49	Laszlo Horvath, Ilona Peszlen, Perry Peralta, Bohumil Kasal, and Laigeng Li: Mechanical properties of transgenic aspen with reduced lignin content and increased S/G ratio	59
	15:52	Balaz Horvath, Perry Peralta, Ilona Peszlen, Bohumil Kasal, and Laigeng Li: Effect of lignin on the thermo-mechanical properties of transgenic aspen	61
	15:55	Gunthard Scholz, Andreas Krause, Ernst Bäucker, and Holger Militz: Wax deposits after wood impregnation	63

16:00	COFFEE BREAK	R2
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16:30 — 17:50

Session IV - Modelling of Wood at Macro- and Meso-scale (WG3)			R1
Chairperson: Janis Varna			
ORAL	16:30	Edwin Nagy, William G. Davids, and Eric N. Landis: Modeling multiple stress states in wood with a non-linear lattice	65
	16:50	José Xavier, Joao Pereira, Fabrice Pierron, José Morais, and José Lousada: On the estimation of elastic properties of wood at the growth ring scale	67
	17:10	Ari Salmi, Lauri Salminen, and Edward Haeggström: Fatigue in cycle loading of softwood	69
	17:30	Peter Mackenzie-Helnwein: The 3-D challenge for thermo-hygro-viscoelastic-plastic modeling of wood: availability of and need for experimental evidence	71

Tuesday, May 12, 2009

08:30 — 09:10

Keynote Session III

Chairperson: Lisbeth Thygesen

R1

08:30 **Callum Hill:** The interaction of the cell wall of modified wood with water vapour

73

09:10 — 10:30

Session V - Moisture Effects (WG2+3)

Chairperson: Lennart Salmén

R1

09:10 **J.M. Husson, Frederic F. Dubois, Nicolas Sauvat, and Octavian Pop:** Numerical model about hygro-lock effect in the mechano-sorptive behavior

75

ORAL

09:30 **Wieslaw Olek, Patrick Perré, and Jerzy Weres:** Inverse modeling of non-Fickian diffusion in wood

77

09:50 **Wielsaw Olek and Jerzy Weres:** Sorption methods for determining bound water diffusion and surface emission coefficients in wood

79

10:10 **Bartosz Rachwal, Michal Lukomski, and Lukasz Bratasz:** Computer modeling of polychrome wood response to climatic variations

81

10:13 **Mats Ekevad:** Modelling thermoelasticity and hygroelasticity for orthotropic materials

83

10:16 **R. Cristian Neagu, E. Kristofer Gamstedt, and Stig L. Bardage:** Analytical micromechanical analysis of the hygroelastic behaviour of compression wood tracheids

85

POSTER

10:19 **Sonja Ziegler and Peer Haller:** Thermo hydro mechanical behavior of poplar from short term plantation under transversal compression

87

10:22 **Régis Pommier, Lech Muszynski, and Boris Clouet:** Micro-mechanical behaviour of green bonded finger joints

89

10:25

COFFEE BREAK

R2

11:00 — 12:40

Session VI - Nanomechanics and Nanoindentation (WG2)		R1	
Chairperson: Josef Eberhardsteiner			
ORAL	11:00	Siqun Wang, Cheng Xing, Yan Wu, Xinan Zhang, Qingzheng Cheng, and Yujie Meng: Nano-mechanics: theory, methodology and application in wood science	91
	11:20	Karl Bytebier, Olivier Arnould, and Richard Arinero: Mechanical characterization of wood viscoelasticity at the submicrometre scale	93
	11:40	Joseph E. Jakes, Charles R. Frihart, James F. Beecher, and Donald S. Stone: Improved nanoindentation techniques for wood research	95
	12:00	Andreas Jäger, Karin Hofstetter, and Josef Eberhardsteiner: The relation between microfibril angle and indentation modulus of wood cell walls	97
	12:20	M. Teresa Cuberes: Mechanical diode-based ultrasonic atomic force microscopies: applications in wood nanomechanics	99

12:40	LUNCH	R4
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14:00 — 14:40

Keynote Session IV		R1
Chairperson: Kristofer Gamstedt		
14:00	Karim Mazeau: Atomic-scale interaction features between the plant cell wall polymers	101

14:40 — 16:00

Session VII - Multiscale Modelling of Hygro-elastic and Fracture Behaviour of Wood (WG3)		R1	
Chairperson: Michael Jarvis			
ORAL	14:40	Janis Varna and Erik Marklund: Applicability of engineering models in multiscale modeling of natural fiber hygro-elastic properties	103
	15:00	Tancreède Alméras, Bruno Clair, and Joseph Gril: The origin of maturation stress in tension wood: using a wide range of observations to assess hypothetic mechanistic models	105
	15:20	Thomas K. Bader, Karin Hofstetter, Christian Hellmich, and Josef Eberhardsteiner: Multiscale microporomechanics model for estimation of elastic limit states of softwood materials	107

POSTER	15:40	Loane Bigorgne, Hubert Maigre, and Michel Brunet: Experimental analysis of crack transverse propagation in softwood	109
	15:43	Dominique Derome and Jan Carmeliet: Multi-scale approaches for modeling of wood	111
	15:46	Mustafa Aslan: Characterisation and modelling of wood fibres and wood fibre composites	113
	15:49	Alexis Beakou, R. Ntenga, J. Atangana Atéba, and L. Ayina Ohandja: Multiscale modelling of the elastic properties of a plant fibre using image-based Veronoi cells	115
	15:52	Viivi Koivu, Arttu Miettinen, Tuomas Turpeinen, Markku Kataja, and Jussi Timonen: Microscopic behavior of heterogeneous materials under deformation	117
	15:55	Frederic F. Dubois, Octavian Pop, Mamadou Meite, Christophe Petit, J. Absi, and Rostand Moutou Pitti: Numerical and experimental approach for crack growth in wood	119

16:00	COFFEE BREAK	R2
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16:30 — 17:50

Session VIII - Wood Ultrastructure and its Effects on Macroscopic Behaviour (WG1+2)			R1
Chairperson: Staffan Svensson			
ORAL	16:30	Albertas Laurinavicius, Antanas Baltrusaitis, Vilija Pranskeviciene, and Kristina Ukvalbergiene: Wood characterization by scanning millimeter wave beam	121
	16:50	Lech Muszynski, John A. Nairn: Coupling advanced imaging analysis and morphology based modeling for integrated characterization of micromechanics of wood and wood-based composites	123
	17:10	Jan T. Bonarski and Wieslaw Olek: Wood ultrastructure changes induced by cyclic variation of relative humidity of moist air	125
	17:30	Pekka Tukiainen and Mark Hughes: Fracture of spruce and birch in the RT crack propagation direction based on in-situ ESEM testing	127

19:30	BANQUET	
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Wednesday, May 13, 2009

08:30 — 12:40

Working Group meeting

08:30	Working Group 1 meeting	R1
08:30	Working Group 2 meeting	R2
08:30	Working Group 3 meeting	R3
11:30	General discussion	R1

The Working Group meetings take place in parallel. The General discussion takes place in plenum.

12:40

LUNCH

R4

14:00 — 16:00

Management Committee meeting

R1

14:00 Management Committee meeting