



International Newsletter

Research Institute for Sustainable Humanosphere, Kyoto University, Japan

= Foreword =

International Research Activities at RISH in 2010

Professor Hiroshi Yamakawa
Chair of the International Academic Exchange
Committee, RISH, Kyoto University



Humanospheric science is a new interdisciplinary science, the goal of which is to conduct research concerning a “humanosphere” comprising of “four spheres” including outer space, the atmosphere, the “forest-sphere”, and the human living environment, all of which are vital to human existence. The Research Institute for Sustainable Humanosphere (RISH) of Kyoto University was established in 2004 to promote this new science with academic activities and education through domestic and international collaborative research programs. RISH contributes to both academic and public societies, and international collaborations play especially important roles in the academic activities of RISH. In fact, most members of RISH have been involved in multilateral collaborations with other universities or research institutes at both the domestic and international levels.

On April 16, 2010, an MOU (Memorandum of Understanding) was signed

between Professor H. A. Muin, Dean of the Faculty of Forestry, Tanjungpura University, Pontianak, West Kalimantan, Indonesia, and Professor T. Tsuda, Director of RISH. Tanjungpura University is an Indonesian national university locating in Pontianak, the capital city of West Kalimantan Province. The research collaboration between RISH and the Faculty of Forestry, Tanjungpura University, was started in 1996 under the JSPS-LIPI Core University Program in the field of wood science, and that program ran from 1996 to 2005. Since that time, the two institutions have conducted continuous collaboration and have finally reached the present MOU. With the signing of this MOU, a new comprehensive and efficient partnership will be built between the two institutes. Prof. T. Yoshimura, who played an important role in promoting the MOU, summarized the recent activities.

Following the last two successful Schools in 2008 and 2009, the Humanosphere Science School 2010 (HSS2010)

was held at Gadjah Mada University Club, Yogyakarta, Indonesia, on June 10-12, 2010. The purpose of the HSS2010 was to share the state-of-the-art research results in humanosphere sciences among Indonesian and Japanese young scientists. With a total of 116 participants from Indonesia (111) and Japan (5), the HSS2010 was very successful and inspiring. The research introductions from the five RISH students, Ms. M. Yokozeki, Mr. S. Nonaka, Ms. M. Nishioka, Mr. R. S. Maail, and Mr. Y. P. Prihatmaji, were very informative and provided a challenge to discover new research topics in the humanosphere sciences. Prof. T. Yoshimura reported on the HSS2010 in more depth in this issue.

Professors T. Tsuda and M. Yamamoto and Associate Professor H. Hashiguchi presented an outline of the ceremony for the 25th anniversary of the Middle and Upper atmosphere radar (MU radar). The MU radar facility is located at Shigaraki MU Observatory, Shigaraki, Koka-city,

Japan. Since 1984, the MU radar has been widely used by both domestic and international collaborative researchers. The ceremony for the 25th anniversary of the MU radar, with 150 participants, took place on September 2, 2010, at the Uji Obaku Plaza on the Uji campus of Kyoto University. The international symposium on the 25th anniversary of the MU radar was also held on September 2 and 3, 2010, at the same venue.

Our international activities are also supported by many Visiting Professors. We welcomed, from October 2009 through October 2010, Dr. W. Ke from the University of Montreal, Canada, whose research theme was “Research of a System of Wireless Power Transmission via Millimeter-wave”, Dr. K. Sujata from the University of Adelaide, Australia, whose theme was “A Study on Equatorial Atmosphere Dynamics by Means of a Radar Observation Network”, Dr. D. Y. Wang from the University of New Brunswick, Canada, whose theme was “Study of Stratospheric Dynamical

Processes and Ozone Variations by Space-Based Multi-Sensor Datasets”, Dr. D. Nunn from the University of Southampton, UK, whose theme was “Theory and Simulations on VLF Chorus Emissions”, Dr. B. Nanan from the University of Sheffield, UK, whose theme was “Study of Coupling of the Thermosphere-ionosphere Region with the Regions Below and Above”, and Dr. Min-Fu Hsu from National Cheng Kung University, Taiwan, whose theme was “Comparison of Structural Behaviour of Timber Frames Used in Japanese and Taiwanese Traditional Temples”.

Dr. Min-fu Hsu and Dr. D. Y. Wang report on their visits and research activities at RISH in articles entitled “The Experiment on Taiwanese Dei-dou Wooden Frames” and “Safeguard Both Climate and Ozone Layer”, respectively. Among six Mission Research Fellows pursuing four missions at RISH, Dr. Y. Wang reports on her research topics and experiences in an article entitled “My new research at RISH -Mechanism elucidation of liquid perme-

ability of softwood-” and Dr. D. Jana, who is currently a JSPS Post-Doctoral Fellow, reports on “Investigating the Potential of Cellulose Nanofibres to Tailor the Morphology of Polymer Foams”.

We are hoping that these international activities will greatly support the establishment of a sustainable society worldwide. All reports by the Visiting Professors at RISH and the International Symposia held by RISH from March to September 2010 are summarized at the end of this Newsletter, including the IGAC-SPARC International Workshop (130th RISH Symposium), International Symposium on Radar and Modeling Studies of the Atmosphere (131st RISH Symposium), Humanosphere Science School 2010 (HSS2010), Towards Establishment of Sustainable Humanosphere (152nd RISH Symposium), and International Symposium on the 25th Anniversary of the MU Radar (156th RISH Symposium).

= News Topics =

The MOU with the Faculty of Forestry, Tanjungpura University, Indonesia

Professor Tsuyoshi Yoshimura

The signing ceremony of a MOU (Memorandum of Understanding) was held between Professor H. Abdurrani Muin, Dean of the Faculty of Forestry, Tanjungpura University, Pontianak, West Kalimantan, Indonesia, and Professor Toshitaka Tsuda, Director of RISH, Kyoto University, Kyoto, Japan, on April 16, 2010. Since Professor Tsuda was not able to join the ceremony due to an event at the university, I, acting as a representative from RISH, brought a MOU with Professor Tsuda's signature. Professor H. Chairil Effendy, Rector of Tanjungpura University and I signed as witnesses after the signing by Professor H. Abdurrani Muin. Mr. Junpei Ueda from the administration office also

joined the ceremony as a supporting staff member.

At the signing ceremony, I conducted a short seminar with the participation of many faculty members Tanjungpura University to overview the current study topics held at RISH, including a brief introduction to Kyoto University.

Tanjungpura University is an Indonesian national university locating in Pontianak, the capital city of West Kalimantan Province. The university consists of nine faculties and over 17,000 students, and plays a major role as the highest educational organization in West Kali-

mantan Province. The corresponding institution with which RISH signed the MOU is the Faculty of Forestry.

The research collaboration between RISH and the Faculty of Forestry, Tanjungpura University, began in 1996 under the JSPS-LIPI Core University Program in the field of wood science, which lasted from 1996 to 2005. Since the program ended, the two institutions have conducted continuous collaboration and have finally attained a fruitful



The signing ceremony by Rector H. Chairil Effendy (middle) and Dean H. Abdurrani Muin (right)

result, the present MOU. It should be noted that Dr. Yuliati Indrayani, the first Vice-Dean of the Faculty of Forestry, who took a Doctoral Degree at RISH, worked a great deal to finalize the MOU.

Pontianak City is located just beneath the equator, and there are some meteorological facilities of LAPAN, the National Institute of Aeronautics

and Space-Remote Sensing Affairs, in the city. RISH members working in the field of atmospheric science, such as Professor Tsuda and Associate Professor Hiroyuki Hashiguchi, have been collaborating with the staff at these facilities for a long time. After the signing ceremony, Professor Yoshimura and Mr. Ueda visited one of the facilities to see the co-operating

observation apparatuses.

With the signing of this MOU, a new comprehensive and efficient partnership will be built between the two institutes. Thus, the members of RISH hope to actively promote academic exchange and enhance educational services through joint research, joint hosting of symposia, and an exchange of faculty members.

= News Topics =

Ceremony for the 25th Anniversary of the MU Radar

Professor Toshitaka Tsuda,
Professor Mamoru Yamamoto,
and Associate Professor Hiroyuki Hashiguchi

The Middle and Upper atmosphere radar (MU radar), located at Shigaraki MU Observatory, Shigaraki, Koka-city, Japan, is the most capable atmosphere radar facility in the world. Since 1984, the MU radar has been widely used by both domestic and international collaborative researchers. The MU radar is powerful VHF-band atmosphere radar with a center frequency of 46.5 MHz and a peak output power of 1 MW that provides fast beam steering and flexibility for various observations. Various new perspectives and insights in meteorology, upper atmosphere dynamics, and astronomical physics have been discovered through the MU radar observations. The ceremony for the 25th anniversary of the MU radar, with 150 participants, took place on September 2, 2010, at the Uji Obaku Plaza on the Uji campus of Kyoto University. An international symposium on the 25th anniversary of the MU radar was also held on September 2 and 3, 2010, at the same venue.

The ceremony was chaired by Mr. Yasuyuki Konishi, Director, Uji Administration Office, Kyoto University. The opening address was given by Professor Toshitaka Tsuda, Director, RISH, Kyoto University. Professor Hiroshi Matsu-

moto, President, Kyoto University, addressed to expect a future advance in research activities related with the MU radar and Shigaraki MU Observatory. Four thoughtful congratulatory addresses were presented by Mr. Harumi Koyama, Director for Research Coordination, Scientific Research Institutes Division, Research Promotion Bureau, Ministry of Education, Culture, Sports, Science and Technology (MEXT), Professor Robert A. Vincent, President, Scientific Committee on Solar-Terrestrial Physics (SCOSTEP), Professor Ryoichi Fujii, Vice President, Nagoya University, and Dr. Masahito Ishihara, Director, Meteorological Satellite and Observation System Research Department, Meteorological Research Institute, Japan Meteorological Agency.

logical Research Institute, Japan Meteorological Agency.

A 10-minute movie describing the advances of the MU radar from its construction to the recent events at the Observatory was played. Professor Toshitaka Tsuda presented letters of appreciation to the Mitsubishi Electric Corporation and to Koka-city, each of which contributed a great deal to the continuous operation of the MU radar. After the exhibition of congratulatory telegrams, the closing address was presented by Professor Takashi Watanabe, Vice Director, RISH, Kyoto University.

After the ceremony, Professor Mamoru Yamamoto, RISH, Kyoto University chaired the reception for the 25th anniversary of the MU radar. After the opening address by Professor Toshitaka Tsuda, four congratulatory addresses that included anecdotes about the MU radar were given by Emeritus Professor Shoichiro Fukao, Kyoto University, Professor Akimasa Sumi, Executive Director, Transdisciplinary Initiative for Global Sustainability, Integrated Research System for Sustainability Sci-



Symposium participants, 2-3 September 2010, at the Uji Obaku Plaza on the Uji campus of Kyoto University

ence, the University of Tokyo, Dr. C.H. Liu Academia Sinica, Vice President, and Dr. Juergen Roettger Max-Planck-Institute, Senior Scientist Emeritus. The reception party started with a toast by Emeritus Professor Susumu Kato,

Kyoto University. More than 130 participants enjoyed the reception for the 25th anniversary of the MU radar.

The international symposium on September 2-3 was devoted to a review of the many scientific achievements

obtained at the MU radar observatory during the 25 years of its operation, and a discussion of the ongoing research of the atmosphere and ionosphere and future plans related to the MU radar and its observatory.

= News Topics =

Humanosphere Science School (HSS) 2010 in Gadjah Mada University

Professor Tsuyoshi Yoshimura

Following the last two successful Schools in 2008 and 2009, the Humanosphere Science School 2010 (HSS2010) was held at Gadjah Mada University Club, Yogyakarta, Indonesia, on June 10-12, 2010. The purpose of the HSS2010 was to share the state-of-the-art research results in humanosphere sciences among Indonesian and Japanese young scientists. With a total of 116 participants from all over Indonesia (111) and Japan (5), the HSS2010 was very successful. The research introductions from the five RISH students, Ms. Makiko Yokozeki, Mr. Sho Nonaka, Ms. Mimei Nishioka, Mr. Rohny Setiawan

Maaail and Mr. Yulianto Purmono Prihatmaji, were very informative and provided a challenge to discover new research topics in the humanosphere sciences.

Proceedings of the lectures were delivered to all participants with the program book, which listed the program, social activities, lecturers and participants, and brief CVs of lecturers. Brief introductions of RISH and RDUB were also included in the book.

On the last day of HSS2010, a full-day culture trip to Borobudur and Prambanan temples was held, with the participation of the Japanese lecturers and students.

The organizers and supporting organizations/programs and lecturers are listed below.

Organizers:

Research Institute for Sustainable Humanosphere (RISH), Kyoto University

Research and development Unit for Biomaterials (RDUB), LIPI Gadjah Mada University (UGM) Center for Southeast Area Studies (CSEAS), Kyoto University

Supporting Organization/Programs:

Global-COE Program, Kyoto University

AA-JSPS Program, Kyoto University

Kyoto University

Lecturers:

RISH: Prof. Toshitaka Tsuda, Prof. Shuichi Kawai, Prof. Naoki Shinohara, Prof. Tsuyoshi Yoshimura, Assoc. Prof. Kenshi Takahashi, Assist. Prof. Tomohiko Mitani

CSEAS: Dr. Satoko Hamamoto, Ms. Hiroko Kinoshita, Mr. Mohamad Najmul Islam

LIPI: Prof. Endang Sukara

RDUB: Dr. Sulaeman Yusuf

UGM: Prof. Mohammad Na'im, Dr. Sri Nugroho Marsoem

LAPAN: Dr. Dhani Herdiwijaya

IPB: Prof. Bambang Hero Saharjo



Prof. Toshitaka Tsuda delivers opening remarks



The culture trip

= Visiting Professor =

The Experiment on Taiwanese Dei-dou Wooden Frames

Dr. Min-fu Hsu, Visiting Professor from National Cheng Kung University, Taiwan

Due to the MOU signed between the Research Institute for Sustainable

Humanosphere (RISH) of Kyoto University and the College of Planning





Figure 1 The real frame



Figure 2 The duplicate frame

and Design of National Cheng Kung University (N.C.K.U.), I have prepared two wooden frames in Taiwan, one of which is the real one made from Hinoki (Fig. 1) and the other of which is the duplicate one made from Sugi (Fig. 2), to become two specimens for use in the cooperative structural experiments at the Laboratory of Structural Function. This effort is a part of the comparative studies between Japanese wooden structure and Taiwanese wooden structure jointly led by Professor Kohei Komatsu and me. As a result of this work, I was invited by RISH as a visiting professor from 19 July to 18 October 2010.

The real frame was a part of the "Doorway Hall" of the "Ancestral Hall"

for the Chung Family at Ping-tung County in the southern part of Taiwan. The Ancestral Hall was rebuilt in 1930 and then completed in 1935, when Japanese occupied Taiwan. In 1995, due to the expansion of the road at the front of this Ancestral Hall and its Doorway Hall were scheduled to be destroyed. I was informed of these plans by a local alumnus of the Department of Architecture of N.C.K.U. and thus had a chance to hire workers to carefully dismantle the front part of this hall.

After building the copy frame, we performed experiments to test the frames. The details of the materials, load applied, and other experimental plans were planned, and then the experimental setup and dimensions of the specimens were prepared and assembled by the help of a master carpenter from Taiwan from 7 to 13 August. The roof weights reflect the dimensions of the entrance, which ranges from 2.5 to 5 m. In the first stage of the experiment, the load was released when small displacement was reached (1%), and then a cyclic loading test was applied until large deformation occurred. To simulate the roof weight, we applied 16, 21, 26, and 31 kN as vertical loads. Using specimen A as an example, we observed the same phenomenon in specimen B, which was that the vertical loads positively affected the structural behavior of these two Taiwanese wooden frames, as expected. The maximum loads at 1% story drift with these different vertical

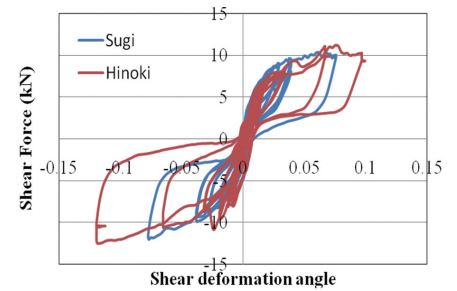


Figure 3 Comparison of the two specimens

loads were 5.06, 6.51, 6.98, and 7.46 kN-m.

The hysteretic loops of the two specimens are given in Fig. 3, from which severe pinching and effects of column racking were observed. There was no significant difference between the two specimens in terms of strength or stiffness; this means that the material and its age do not play a significant role in the strength or the stiffness.

The racking of the column, the story drift of the global frame, and the timber joint of specimen A can be compared, from which we can learn that the story drift of the entire structure comes from racking of the column. The comparison between joint A and the racking of the column has revealed that the upper structure is very rigid and that joints A and B, apart from column racking, provide most of the moment resistance for the structure.

After the experiment, the real frame will be presented as a gift to RISH and be displayed in the Xylarium at RISH. The duplicate frame without any decoration will be displayed in the Wood Composite Hall at RISH.

= Visiting Professor =

Safeguard Both Climate and Ozone Layer

Dr. Ding-Yi Wang
Visiting Professor from University of
New Brunswick, Canada



The stratospheric ozone is important for shielding the planet from harmful solar radiation. Ozone depletion and global warming have become serious

environmental issues. A major cause of the depletion is trace gases such as chlorine and bromine compounds originating from human-made chlorofluorocarbons

(CFCs), halogen-containing substances, and the like. The space-based Japanese

instrument SMILES (Superconductive Submillimeter-Wave Limb-Emission Sounder) provides global measurements of the minor constituents (O₃, HCl, ClO, HO₂, HOCl, BrO, O₃ isotopes, HNO₃, CH₃CN, etc.) that allow researchers to study the ozone destruction.

Under the invitation of Prof. Masato Shiotani (SMILES Principal Investigator), I had the opportunity to work with him at RISH from 1 March to 28 June, 2010. This was my first experience working in Japan. As a research scientist, I have been working on satellite observations of the middle atmosphere for many years in Canada, USA, Germany, Australia, and China. The main topic of my research at RISH was to characterize diurnal variations of the stratospheric ozone by using space-based multi-sensor datasets.

Understanding the global ozone diurnal variations provides important information on the photochemistry, dynamics and transport, and energetics of the atmosphere. The earlier measurements generally have rather poor spatial or temporal coverage. Studies from such data sources have therefore been restricted to the analysis of day-night differences or to the mesosphere, where the diurnal variation is most remarkable.

Our study uses three space-based instruments: the MLS/Aura (Microwave Limb Sounder), the SMR/Odin (Sub-Millimeter Receiver), and the MIPAS/Envisat (The Michelson Interferometer for Passive Atmospheric Sounding). The three sun-synchronous instruments

can make measurements covering all latitudes from pole to pole and at six different local times simultaneously on the same day for a given latitude. Using the combined data sets observed during 2007 and 2009, we are examining the characteristics of global ozone distributions and the seasonal and diurnal variations in the stratosphere and the lower mesosphere.

A major finding is the presence of ozone diurnal variation maxima around 5 hPa and 75° latitudes in both hemispheres during the late spring and summer months (Figure). The maxima have peak values of ~0.4 ppmv or the percent deviations of ~10-15% with respect to the midnight value, and occur around

local time 6:00 PM. The observations are generally in agreement with the simulations of the Chemistry-Climate Model at the Meteorological Research Institute, Japan. The results were presented at two international workshops, and a journal paper describing our findings is under preparation for submission.

My visit at RISH was fruitful. It is my great pleasure to express my heartfelt gratitude to my host, Prof. Shiotani, to the International Exchange Program of Kyoto University for providing financial and scientific support, and to Ms. Akemi Hatano and my colleagues at RISH for their many kinds of help. Whenever I am, wherever I am, whatever I do, there is no end to keeping the memory green!

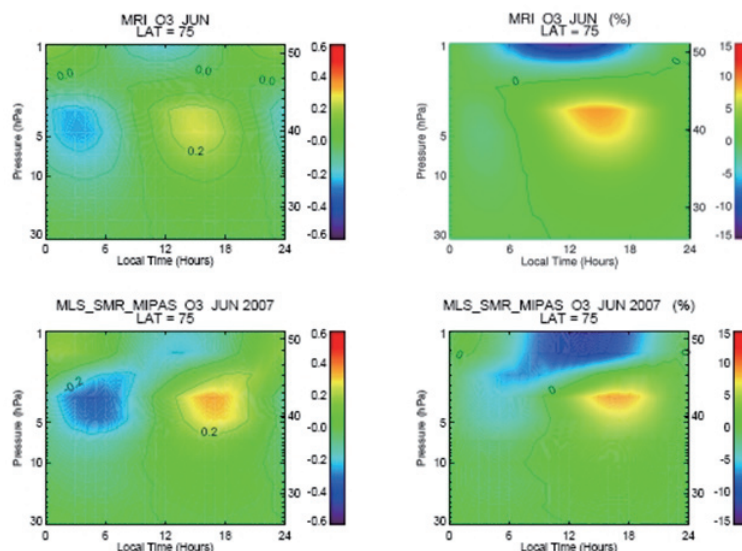


Figure 4 Local time-pressure cross sections of zonal-mean ozone diurnal variation fields (in ppmv) in June 2007 at 75°N (left) and percent deviations (right) from the midnight values at each pressure level. The data are derived from the MRI-CCM simulation (top) and from the combined MLS/Aura, SMR/Odin, and MIPAS/Envisat measurements in 2007 (bottom). 0 h is midnight, and 12 h is noon.

= Post-doctoral fellow =

Investigating the potential of cellulose nanofibres to tailor the morphology of polymer foams

Dr. Jana Dlouhá
JSPS Post-doctoral Fellow



During my engineer studies in Czech Republic and my PhD in France, I have

mainly studied mechanical properties of wood. Wood is fascinating natural com-

posite with complicated hierarchical structure starting from the nanoscale. At

the cell wall level, cellulose microfibrils are embedded in softer matrix made up of hemicelluloses and lignin. Microfibrils represent the strongest element of the wood cell wall. After removal of the matrix, it is possible to mechanically further fibrillate macroscopic wood fibres to nanofibres. Cellulose nanofibres represent the main research activity of the Laboratory of Active Bio-based Materials headed by Professor Hiroyuki Yano who kindly supported my application for post-doctoral fellowship.

Thanks to excellent mechanical properties, high aspect ratio and huge surface area cellulose nanofibres are often used to improve thermo-mechanical properties of polymers. In the field of nanocomposite materials, porous materials such as aerogels or foams have recently drawn a great deal of attention. In case of cellulose nanocomposites, porosity is typically achieved by freeze-drying or supercritical drying. On the other hand in polymer science, microcellular foams are mostly produced by supercritical foaming. Here, a solid polymer is saturated by supercritical fluids in molten state and bubbles are nucleated upon

rapid depressurization of the polymer melt-supercritical fluid system. Reduce the cell size to nanoscale while keeping high porosity is nowadays the main challenge in this field.

Nucleation of bubbles upon depressurization is mainly determined by processing conditions and interfacial tension at the nucleating site. If the nucleation rate is high, the gas in the polymer melt is consumed for generation of bubbles and less quantity remains available for their growth. Thus, high density cell foams with tiny pores can be achieved. Nanoparticles may promote the nucleation process but their potential to act as nucleating agent depends on the size, geometry, level of dispersion and relative decrease of interfacial tension at the nucleating site. Even if the morphology of foams is generally improved after addition of nanoparticles, it is often difficult to realize all the nucleating potential because of problems with particles aggregations and relative energetic inefficiency of additional nucleating sites.

In the present work, we try for the first time to use cellulose nanofibres

to tailor the morphology of foams produced with supercritical CO₂. We used polyvinyl alcohol as a matrix because of good affinity with cellulose. Moreover, by changing the degree of hydrolysis of PVA (polyvinyl alcohol) one can change the solubility of CO₂ in the polymer as well as the strength of interactions between nanofibres and matrix. While for fully hydrolyzed PVA the nucleating efficiency of CNF (carbon nano fiber) was poor, in the case of partially hydrolyzed PVA the density of cells significantly increased. In both polymers CNF also considerably restricted the cell growth. To further investigate the potential of CNF to affect the foaming process, modification of the filler and of the matrix by CO₂-philic groups will be investigated. We hope to obtain competitive results compared to the effect of nanoclay or carbon nanofibres used in previous studies.

I sincerely wish to thank Prof. Yano for providing me the opportunity to work at RISH and for supporting my research here and I also would like to thank JSPS foundation for financial support.

= Post-doctoral fellow =

My new research at RISH -Mechanism elucidation of liquid permeability of softwood-

Dr. Yue Wang
Mission Research Fellow

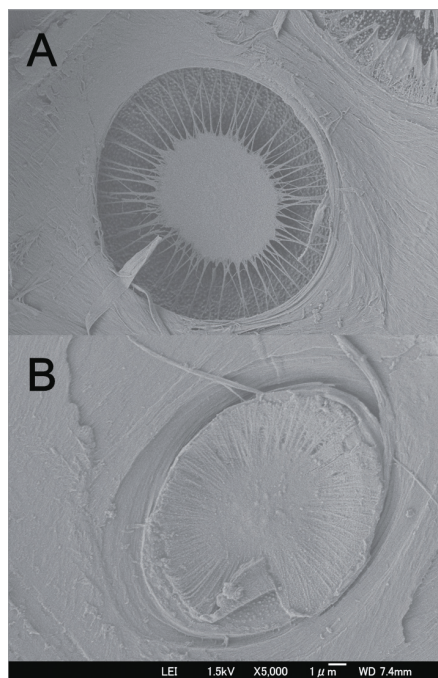
It has been two years since I wrote a short manuscript describing my research in the adaptation of reaction wood in response to environmental changes for the RISH International Newsletter. For the past two years, I have continued this research at the Laboratory of Biomass Morphogenesis and Information (LBMI) under a JSPS postdoctoral fellowship. I completed this research project in March 2010, and I would first like to express my appreciation to my supe-

rior, Prof. Sugiyama Junji, and to other staff members and students of LBMI, for giving me a support and assistance to make my work better.

Since April 2010, I have been pursuing my new research into the liquid permeability of softwood as a mission researcher at RISH. In living coniferous trees, bordered pits (Fig. A) are essential paths for liquid transportation from one tracheid to another. However, these paths are always occluded because

of pit aspiration (Fig. B) caused by heartwood formation and air drying. The pit aspiration causes problems for the timber and wood products industry, because the time needed for drying timber increases, the moisture content of the dried timber is heterogeneous, and preservatives are unable to permeate the inside of the timber. These problems result in high cost and low quality. To recover the conductive function of the





bordered pits and improve the liquid permeability of wood, researchers have investigated the following three types of method: (1) biological methods using bacteria, enzymes, or fungi to degrade the pit membrane (PM); (2) chemical methods using different solvents to extract the deposits or degrade the pit border; and (3) physical methods using transverse compression, freeze-drying, smoke-heating treatments, and the like to make irreparable damages to the PM. As is clear from these methods, the rupture of the PM is the key to opening the aspirated bordered pit.

Currently, my research focuses on the effect of morphological variability of PMs on the efficiency of transverse compression to improve liquid permeability of softwoods. First, I investigated the mechanical properties of the PM.

Using a laser microscope, I observed the deformations of aspirated PMs during transverse compression, and I evaluated the relationship between deformation and stress. Second, to clarify the physical properties of the PM, especially the influence of incrustation, I subjected samples to ethanol-benzene extraction and extraction-compression combined treatments. Third, I used scanning electron microscopy to observe the rupture of the PM due to compression. Next, I will measure the amount of liquid permeability of treated softwoods to evaluate the efficiency of transverse compression and find the best treatment conditions.

I especially want to thank all of my colleagues at RISH for giving me the chance to begin my new post-doctoral research.

Visiting Professors of RISH from October 2009 to October 2010

Period	Name Affiliation	Research title title
1 October 2009-31 December 2009	Wu KE, University of Montreal, Canada	Research of System of Wireless Power Transmission via Millimeter-wave
1 March 2010-30 June 2010	Kovalam SUJATA, University of Sdelaide, Australia	A study on equatorial atmosphere dynamics by means of a radar observation network
1 March 2010-27 June 2010	Ding-Yi WANG, University of New Brunswick, Canada	Study of Stratospheric Dynamical Processes and Ozone Variations by Space-Based Multi-Sensor Datasets
28 June 2010-27 October 2010	David NUNN, University of Southampton, UK	Theory and simulations on VLF chorus emissions
15 July 2010-14 January 2011	Balan NANAN, University of Sheffield, UK	Study of coupling of the thermosphere-ionosphere region with the regions below and above
19 July 2010-18 October 2010	Min-Fu HSU, National Cheng Kung University, Taiwan	Comparison of structural behaviour of timber frames used in Japanese and Taiwanese traditional temples

International Symposium from October 2009 to October 2010

Period	Theme	Place
25-26 October 2009	IGAC-SPARC International Workshop (130 th RISH Symposium)	Inamori Hall at Shiran-Kaikan in Kyoto, Japan
10-13 November 2009	International Symposium on Radar and Modeling Studies of the Atmosphere (131 st RISH Symposium)	Kyoto University Uji Campus, Japan
10-12 June 2010	Humanosphere Science School 2010 (HSS2010): Towards Establishment of Sustainable Humanosphere (152 nd RISH Symposium)	Gadjah Mada University Club, Yogyakarta, Indonesia
2-3 September 2010	International Symposium on the 25th Anniversary of the MU Radar (156 th RISH Symposium)	Kyoto University Uji Campus, Japan

The Committee of International Academic Exchange

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