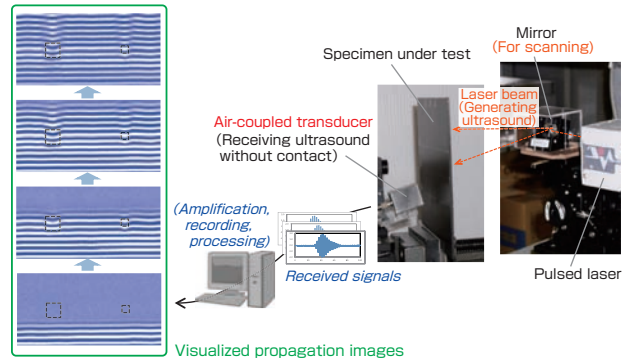


Application of air-coupled sensor to the laser ultrasonic visualization equipment for flaw inspection of structures

A contact-free visualization system of ultrasound for flaw inspection

Nondestructive inspection (NDI) is important to ensure the safety of structures such as power plants, vehicles and infrastructures. Ultrasound is one of the NDI techniques majorly used. Our group has already proposed a ultrasound generation laser scanning system for visualizing ultrasound waves propagating on any shape as an animation image, where flaw can be quickly and easily detected. Recently, we have focused on making the system completely contact-free by applying an air-coupled ultrasound transducer as a receiver, instead of a contact piezo-electric receiver. An advantage of the contact-free receiver is that it makes it easy to move the sensing point, and, as a consequence, images from different points of view can be obtained. Reductions of the effects of surface conditions of specimens and contact situations of the receiver are also advantages of the contact-free receiver. Improvements on noise reduction, higher sensitivity, and signal processing are now in progress aiming at more clear and speedy visualization.



Outline of non-contact visualization of ultrasound propagation with air-coupled sensor and an example of visualized propagation images

The visualized images show the propagation of ultrasound on a carbon fiber reinforced plastic with delaminations. Area of visualization is 50×100 mm. Propagation of 320 kHz A_0 Lamb wave is visualized with receiving angle 14.6°. Sizes of the delaminations shown with dotted lines are 10 mm sq.(left) and 5 mm sq.(right).

Kei URABE

Research Institute of
Instrumentation Frontier

urabe-k@aist.go.jp

AIST TODAY Vol.10 No.11 p.16 (2010)

In Brief

Cooperation with Mongolia in Geological Survey and Mineral Resource Research

On July 30, 2010, AIST concluded a comprehensive memorandum of understanding (MOU) on cooperation in geological survey and mineral resource research of Mongolia with the Ministry of Mineral Resources and Energy of Mongolia and Japan Oil, Gas and Metals National Corporation (JOGMEC) during Mongolian Minister Dashdorj Zorigt's visit to Japan.

With this conclusion, the three parties aim to strengthen reciprocal cooperative relations in geological survey and mineral resource projects, and will discuss specifics of cooperative projects for developing rare metal resources which are important for high-tech industries. Especially AIST, with its experience of research and technological support concerning mineral resources of Mongolia since the days of the Agency of Industrial Science and Technology, will promote the cooperative project mainly in scientific elucidation and prehension of mineral genesis, properties, and resource potentials of deposits that are the basis of exploration.



AIST President Tamotsu Nomakuchi (left), Minister Dashdorj Zorigt (center), JOGMEC President Hirobumi Kawano (right)

NSTDA President of Thailand Visits AIST Tsukuba

On August 24, 2010, Dr. Thaweesak Koanantakool, the new president of the National Science and Technology Development Agency (NSTDA) which is an incorporated administrative agency under Thai Ministry of Science and Technology, visited AIST Tsukuba, and had talks with AIST President Tamotsu Nomakuchi. They discussed exchange of researchers, implementation of collaborative research projects, and reconfirmed that the relationship is excellent between the two organizations which have signed an memorandum of understanding on comprehensive research cooperation (MOU). President Thaweesak explained that, in October, NSTDA will announce new priority research plans which will be focused on food, medical care, energy and environment. President Nomakuchi expressed that those plans are related in many ways to research done at AIST, and welcomed the plans as potentially contributing to closer collaboration between the two organizations.

President Thaweesak also visited the Research Center for New Fuels and Vehicle Technology, listened

attentively to presentations of biomass fuel research which is a collaborative research project with NSTDA, and asked many questions showing great interest in the project.



AIST President Nomakuchi (left) and NSTDA President Thaweesak (right)

Workshop with Karlsruhe Institute of Technology of Germany

On Sept 14, 2010, a workshop was held at AIST Tsukuba on the main topics of technological transfer and innovation management.

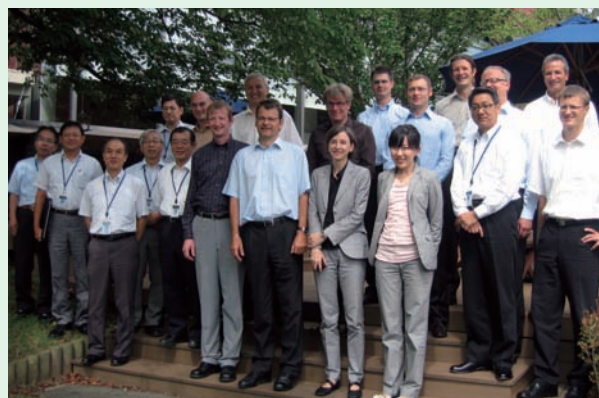
Karlsruhe Institute of Technology (KIT) is a research and educational institute established in 2009 by merging Forschungszentrum Karlsruhe with Universität Karlsruhe, and it is one of 17 member research centres of Helmholtz Association. In April, 2008, before the merger, AIST and Forschungszentrum Karlsruhe concluded a memorandum of understanding on comprehensive research cooperation (MOU). AIST, incidentally, has also concluded an MOU with Forschungszentrum Jülich which is also a member of the Helmholtz Association.

At this workshop, AIST, Helmholtz Association and KIT each gave a brief introduction, alternately gave presentations on technological transfer and innovation management, and discussions were held.

From AIST, the Research and Innovation Promotion Office and the Intellectual Property Department presented the principle of open innovation which AIST promotes, and specific examples of establishing “Tsukuba Innovation Arena (TIA nano)” and technological transfer. There were questions among

others concerning ways in which royalty fees are paid to the inventors. In contrast, KIT’s technological transfer actively promotes startups of venture companies with research outcomes as the core, using networks including private cooperative organizations. The specific mechanism was highly informative for AIST.

AIST has been collaborating with KIT in research mainly in energy, and it is thought that a good foundation has been established also in management for a cooperative relation such as marketing support in technological transfer.



Participants of the workshop