

Three-dimensional imaging of defect distributions using a positron microprobe

A practical technique for evaluating defect distributions in various materials

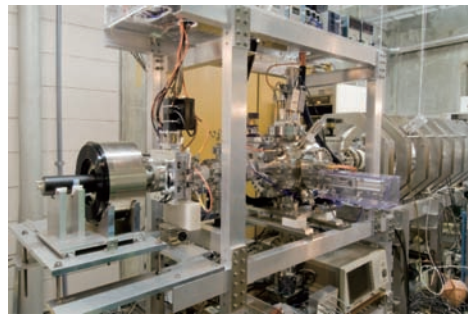
An intense positron microprobe has been developed for obtaining three-dimensional positron lifetime mappings in a sample to permit visual evaluation of defect distributions. The beam diameter of an intense positron beam injected into the sample was 30 micrometers. Two-dimensional images at arbitrary depth were demonstrated of positron lifetimes in a fused silica sample, which was irradiated with ion beams. The time taken to obtain a single image was about 1 hour.

Nagayasu Oshima

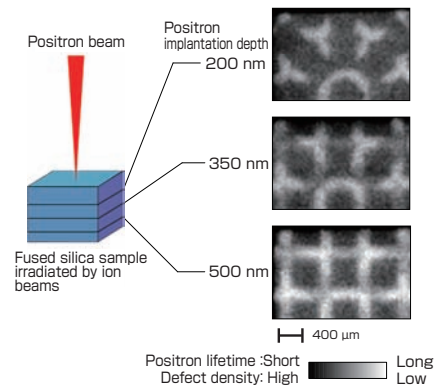
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Positron probe microanalyzer



Positron lifetime images of a fused silica sample

In Brief

Deputy Prime Minister of the Republic of Serbia Visits Tokyo Akihabara Site

On April 17, H.E. Mr. Bozidar Djelic, Deputy Prime Minister and Minister for Science and Technological Development of the Republic of Serbia, and H.E. Mr. Ivan Mrkic, Serbian Ambassador to Japan, visited AIST Tokyo Akihabara Site.

Dr. Akira Ono, Senior Vice-President of AIST, gave a welcoming speech, which was followed by an overview of AIST by the International Affairs Department, and exchanges of views. Dr. Hideki Imai, Director of the Research Center for Information Security, presented an overview of the center, where Dr. Miodrag Mihaljevic from Serbia has been engaged in research since 2006 as an invited researcher.

The former Socialist Federal Republic of Yugoslavia and Japan signed an agreement on scientific and technological cooperation in 1981, and this has been passed on also to the present Republic of Serbia. The Deputy Prime Minister presented the scientific and technological activities of the Republic, and its participation in European programs and

projects such as with FP7 and CERN. He expressed wishes for cooperation with Japan, particularly with AIST, based on the above agreement. The Deputy Prime Minister also stated his interest in revisiting AIST during his next visit to Japan in autumn.

This visit by the Deputy Prime Minister is a good occasion to reconsider future possibilities of research cooperation, including personnel exchange.



Deputy Prime Minister Djelic (left) and AIST Senior Vice-President Ono (right)

MOUs Concluded with 6 US National Laboratories in Energy and Environment Fields

On the occasion of the visit to the US of the then Minister Toshihiro Nikai, Ministry of Economy, Trade and Industry (METI) in early May, 2009, AIST, represented by President Tamotsu Nomakuchi, concluded MOUs with 5 research organizations of the Department of Energy (DOE), and with the National Institute of Standards and Technology (NIST) of the Department of Commerce (DOC). This was done in order to promote and strengthen research cooperation with the US in the fields of energy and environment, and to accelerate the technology development toward the realization of a low carbon society.

The research cooperation between AIST and the US research organizations gained impetus after the visit of the then Minister Nikai to the state of New Mexico in August, 2006, and a collaborative research in fuel cells and hydrogen began with Los Alamos National Laboratory (LANL) in December, 2007. The Obama administration which started in January, 2009, advocates the Green New Deal policy, and aims at the creation of new industry for the realization of sustainable development of society through promotion of R&D mainly in the fields of energy and environment. The Japanese government, in response, has confirmed to promote Japan-US research cooperation in the fields of energy and environment at the Japan-US summit meeting in February, 2009. There is a rapid increase in the momentum of cooperation between the two countries in these fields.

In this context, from the beginning of this year, experts on energy and environment of AIST, along with those of METI and others, have visited the US national laboratories several times for discussions which led to the conclusion of MOUs. The US laboratories which signed the MOUs, and the prospective fields of research cooperation are as follows.

- 1) Los Alamos National Laboratory (LANL): cooperation in the fields of fuel cells and hydrogen, computational science related to materials, and CCS (CO₂ capture and storage)
- 2) Sandia National Laboratories (SNL): cooperation in photovoltaics, nanoelectronics and nanomaterials, and computational science related to materials, as well as bilateral use of inter-lab facilities of nanotechnology
- 3) National Renewable Energy Laboratory (NREL): cooperation in the fields of photovoltaics, bio-fuels (of cellulose origin), and energy analysis
- 4) Lawrence Livermore National Laboratory (LLNL): cooperation in bio-fuels (of cellulose origin), and fuel

combustion technology

5) Lawrence Berkeley National Laboratory (LBNL): cooperation in biofuels (of cellulose origin), nanomaterials for energy, and CCS

6) National Institute of Standards and Technology (NIST) of DOC: cooperation mainly in R&D for international standards

During this visit to the US, on May 1, AIST President Nomakuchi attended the ceremony for signing MOU between METI and the state of New Mexico, and met with H.E. Mr. Bill Richardson, Governor of New Mexico, and the two directors of Sandia National Laboratories and Los Alamos National Laboratory. On the morning of May 4, he visited NIST in Gaithersburg, Maryland, and concluded an MOU there. In the afternoon, he was present at talks between the then Minister Nikai and H.E. Dr. Steven Chu, Secretary of Energy in Washington, DC, and afterwards, concluded research cooperation MOUs with the 5 laboratories of DOE.

In research cooperation, around 20 AIST researchers will be sent to the US this fiscal year, and we intend to establish a collaborative research base for smooth cooperative activities such as joint research and exchange of researchers.



Signing of the memorandum between METI and the state of New Mexico



Dr. Gallagher, Deputy Director of NIST(left), and Dr. Nomakuchi, President of AIST(right)

Cover Photos

Above: Developed laser and electrochemical complex machining system (p. 19)

Below: Mr. Nikai, then Minister of METI, Dr. Chu, Secretary of Energy, Dr. Nomakuchi, President of AIST, and representatives of the 5 US national laboratories after signing the MOUs (p. 24)

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