A technique for quantitative measurement of acoustic cavitation generated by high pressure ultrasound

Measurement technology of generated acoustic cavitation for development of ultrasound medicine

We have been studying quantitative measurement technique for acoustic cavitation in water. We have considered the use of broadband integrated voltage (BIV). BIV was calculated from the high frequency components of signals generated from the cavitation measured by a hollow cylinder type cavitation sensor. The result showed that BIV was dependent on the dissolved oxygen level in distilled water that was used as one of the parameters of the cavitation generation. Also, there was correlation between BIV and the amount of active oxygen species generated by the cavitation. This indicates that BIV has the potential to be used as an index of the amount of generated cavitation in water. In the future, this technique will be applicable to the ultrasound equipment such as an ultrasonic washing machine.

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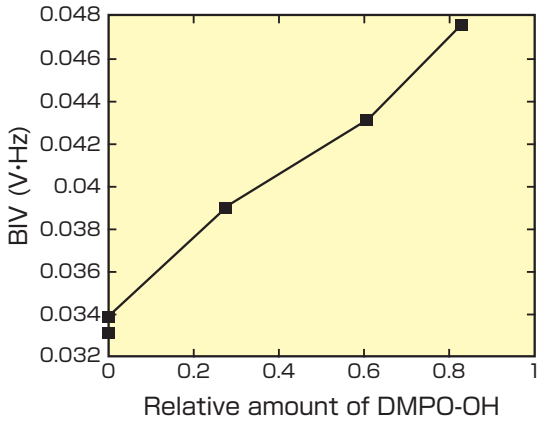

Relationship between broadband integrated voltage (BIV) and the generated active oxygen species.

In Brief

Deputy Chairman of the Federation Council of Russia Visits AIST Tsukuba

On April 23, 2010, AIST Tsukuba was visited by Mr. Mikhail Efimovich Nikolaev, Deputy Chairman of the Federation Council of Russia, three members of the Russian parliament, and people of business in a party which totaled 14 people.

Deputy Chairman Nikolaev visited Japan on the invitation of Mr. Satsuki Eda, President of the House of Councillors of Japan. Apart from talks with Japanese politicians, he had interest in science and technology especially in robots for medical care. Concerning exchange of science and technology between AIST and Russia, he was highly interested in the exchange with the Russian Academy of Sciences, and Russian universities.

After hearing an overview presentation of AIST, he toured, with Vice-President Masakazu Yamazaki, Science Square TSUKUBA where he observed mainly robots, the therapeutic robot, Paro, the human nasal model for endoscopic surgery, and the myoelectric sensor.

During the tour, he tried the myoelectric sensor himself, and received explanation on how it can be applied to prosthetic arms. During his viewing of the "robotic arm for the disabled" of the Intelligent Systems Research Institute, the video presentation and the explanation by the researcher attracted his attention, and he expressed interest in practical implementations such as when it would be commercialized.

Deputy Chairman Nikolaev (second from right) and Vice-President Yamazaki

Secretary of State for the Development of the Capital Region of France Visits AIST Tsukuba

On March 9, 2010, Mr. Christian Blanc, Secretary of State for the Development of the Capital Region of France visited AIST Tsukuba.

Secretary of State Blanc is in charge of the "Grand Paris (a large capital region around Paris)" project which aims to enhance the attractiveness and development of the city, thus maintaining its position as a major metropolis. The main objective of his visit to Japan is to understand how the capital region around Tokyo is developed. He was especially interested in the development strategies of districts which play core roles in specific domains and regions that specialize in innovation, creation and research, and the economic contribution of the transportation network. He came to Tsukuba to verify points of his project theme, and he experienced firsthand the distance between the center of Tokyo and Tsukuba and the transportation infrastructure in a very short time.

Although he used to the utmost Tsukuba Express, the new infrastructure that joins Tokyo and Tsukuba, his schedule was tight and he could only stay for one hour. During his visit to Tsukuba, he toured in a chartered bus, and the only stop he made was at AIST.

Dr. Akira Ono, Senior Vice-President of AIST, welcomed Secretary of State Blanc at AIST and showed him places of his request, namely the Humanoid Research Group of the Intelligent Systems Research Institute and the AIST-CNRS Joint Robotics Laboratory. At this laboratory, AIST and Centre National de la Recherche Scientifique (CNRS) of France are jointly conducting research on intelligent robotic systems. 12 researchers mainly from CNRS are working there, and students from prestigious schools such as École Centrale Paris are receiving training.

Though his stay was short, he watched the demonstration of the humanoid robots and listened attentively to the lectures on its mechanism and ways of utilization. He enthusiastically questioned the researchers and showed high interest in the subject.

Secretary of State Blanc (right) and the humanoid robot HRP-2 under operation

Secretary of State Blanc (second from left) watching the female-type humanoid robot HRP-4C

Cover Photos
Above: SiC-PiN diodes fabricated on 2 inch 4H-SiC wafer (p. 14)
Below: Wettability of hydrophilic plastic film with nanostructured surface (p. 17)

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