
Activities of the MEMS System Development Center

1. Subcommittee Meeting on the Fine MEMS Project (Post-project Evaluation)

In order to bring the Fine MEMS Project to a close, a NEDO research evaluation committee established to assess the R&D conducted over this three-year project held the 1st “Highly Integrated, Complex MEMS Production Technology Development Project” (Post-project Evaluation) Subcommittee Meeting at the WTC Conference Center on October 5, 2009.

Seven committee members participated in the subcommittee meeting, which was chaired by Kuniki Owada (professor at the Department of Information Science, the Faculty of Science and Engineering, Teikyo University). At the subcommittee meeting, the principal investigator Hajime Inuzuka of the Machinery System Technology Development Department (NEDO), which is overseeing the project, explained the significance and necessity of the project and the R&D management implemented. Isao Shimoyama, professor at the University of Tokyo and project leader, then gave an overview of the R&D achievements and prospects for commercialization.

These presentations were followed by a private session in which the heads of development for each company involved in the project presented their research achievements in the eight subsidized projects. In the ensuing public session, Susumu Sugiyama, a professor at Ritsumeikan University and Fine MEMS Project subleader, gave a report on the R&D achievements for seven commissioned projects (excluding the fine MEMS knowledge database and the integrated design platform projects). At the end of the public session, the MEMS System Development Center of Micromachine Center presented the results of compiling the knowledge database and developing the integrated design platform.

At the subcommittee meeting, there was a lively question and answer session among the evaluation committee members and other involved parties. The committee members recognized that the achievements produced in this project was some of the most original and cutting-edge in the world, and there were comments to the effect that the research results overall were outstanding.

The final evaluation of this project is expected to be completed by the end of January 2010 after deliberation by the NEDO research evaluation committee.

2. Report on the Third China & Japan Joint Seminar on Green MEMS and Sensor Networks

On November 24–25, 2009, Japan and China held a joint seminar at the Millenium Hotel in Wuxi, China on MEMS sensor networks, which are currently drawing attention as an area of research that must be pursued to meet future needs for low environmental impact, safety, security, and comfort. The

seminar was organized by the National Institute of Advanced Industrial Science and Technology (AIST) (Dr. Ryutaro Maeda, prime senior researcher) and Peking University (Haixia “Alice” Zhang, professor). A total of thirteen speeches were given at the seminar, including seven from Japan and six from China.

Dr. Maeda described a general strategy for facility management in green MEMS, and discussed the importance of such management and the effects it would have on applications in MEMS networking. His speech drew questions and discussion on specific reductions for CO₂ gases. Prof. Zhang described the MEMS-related market and business activities in China and discussed the concept and importance of incorporating sensor networks in these activities. She also described plans to construct a green clean room at Peking University in order to demonstrate its efficacy and reported that network sensors may also be useful from a safety perspective, and not just a green perspective, as in motion sensors and optical sensors for monitoring human activity and RF and SIC pressure sensors, which are resistant to chemicals and high temperatures. Her speech sparked several questions, such as whether particle sensors were also being considered for use as network sensors in the clean room, and led to a more in-depth discussion that illustrated the high level of interest in sensor networks.

Toshihiro Ito of the AIST talked about a health monitoring system for chickens as one application of MEMS chips and sensor networks. Some felt that this would draw much interest from a marketing standpoint in China, since more than a billion chickens are raised in this country.

The China side also gave presentations on the environment for MEMS technology. Dr. Li Gang of Suzhou Microsensing Company reported on the climate for MEMS venture businesses in China, noting that the MEMS market is still underdeveloped, there is no support from MEMS foundries, few engineers have the necessary skills to develop MEMS, and MEMS industries are not growing. There was sentiment on the Japanese side that this situation presents an opportunity for foundry services.

Wang Hong of China Micro-Nano & Sensor Network Global Innovation Perk reported on activities in Wuxi related to MEMS and sensor networks. The city is trying to attract MEMS businesses and, toward that end, is proactively developing the necessary sites and infrastructure.

Lastly, Prof. Renshi Sawada of Kyushu University informed the participants of plans to hold the fourth seminar in Hokkaido the following August.

In conclusion, the seminar featured a wide variety of presentations on efforts to integrate industry, academia, and government, the core technologies necessary for MEMS research, the environment in China for MEMS, and efforts to develop applications for MEMS sensors, and the event proved to be of great interest to all participants.