

Dissemination and Publicity Projects

1. The 14th MEMS Seminar

The 14th MEMS Seminar on “New MEMS technologies (design, processing, and evaluation) and their product applications” was held on February 5 this year at the Hyogo Prefecture Citizens’ Hall in Kobe, Japan. A total of thirty-seven people participated in the Seminar, which was organized by the Foundry Service Industry Committee (FSIC; chair: Fumihiko Sato of Omron Corporation) under the Micromachine Center (MMC).

Through the support of the New Industry Research Organization, this year’s MEMS seminar featured lectures by representatives of MEMS-related companies in Hyogo Prefecture and its neighboring prefectures, as well as a catalog exhibition during an ensuing technical forum. The program given below illustrates the rich variety of events included at the 14th MEMS Seminar.

- (1) “Advances in MEMS integration and fusion and expectations for the creation of new industries,” Susumu Sugiyama, professor of Ritsumeikan University
 - (2) “Micronano molding technologies for MEMS devices,” Tadashi Hattori, professor of the University of Hyogo
 - (3) Presentations by the FSIC (machining and joining technologies)
ULVAC, Omron, Olympus, National Institute of Advanced Industrial Science and Technology, Panasonic Electric Works, and Hitachi
 - (4) An introduction of technologies by MEMS companies in the Hyogo area
Sumitomo Precision Products, Silicon Sensing Products
 - (5) MEMS device evaluation technologies
Daiichi Kagaku, Oki Engineering
 - (6) Presentations by the FSIC (design and analysis technologies, etc.)
Nihon Unisys Excelutions, Mizuho Information & Research Institute, Mathematical Systems Inc., and the committee chair, Fumihiko Sato
 - (7) Technical forum
FSIC, Silicon Sensing Systems Japan, Kasen Nozzle Mfg. Co.
- The following topics were discussed at the 14th MEMS Seminar.

In his lecture entitled “Micronano molding technologies for MEMS devices,” Prof. Hattori pointed out the need for personnel training and drastic cost reductions in manufacturing processes in order to ensure the market success of products employing MEMS technologies, and explained how a molding technology using micro-molds will be a key technology.

Progress toward establishing and standardizing an evaluation technology for MEMS devices is lagging behind that for semiconductor devices, but this element technology is of utmost importance for developing products that incorporate MEMS. Highly reliable MEMS devices and products will be attainable by using the results of prototype evaluations as feedback in device design. On this topic, we heard lectures on technologies and equipment for controlling the local environment of microdevices with great precision and

technologies and services for diagnosing MEMS-specific processes and analyzing failure modes.

The technical forum that followed the MEMS seminar involved guest exhibitors and stimulated an enthusiastic exchange of technological information. Afterward, the venue was changed to more relaxed surroundings for an informal gathering, where committee members of the FSIC, lecturers, and other participants engaged in a lively exchange of ideas.



The 14th MEMS Seminar

2. The Release of MemsONE Version 3.0

January 20 of this year marked the release of MemsONE version 3.0, a design and analysis support system for MEMS. Developed by an industry-academia joint research consortium comprising nine businesses, thirteen universities, one research institute, and one association, MemsONE is Japan’s first software tool aimed at providing support for efficient MEMS design and development. MemsONE is not only a useful tool for the most sophisticated MEMS researchers and engineers, but also eliminates the stress for researchers and engineers in other areas who are novices or less experienced in the field of MEMS in accessing the most advanced MEMS-related data and know-how.

The following are some of the enhanced features included in this latest release.

- (1) Added the boundary element method to electric field analysis
- (2) Added an all-in-one setup for boundary conditions in thermal nanoimprint analysis
- (3) Expanded the analysis scale for dynamic systems
- (4) Improved the hexahedral mesh generator
- (5) Improved the mask CAD
- (6) Added a function for generating solids (comb-fingers and meander beams)
- (7) Enhanced the function for adding analytical models in the MEMS circuit simulator
- (8) Upgraded the knowledge database from 1,700 to 3,400 items
- (9) Upgraded the material database from 203 to 388 items

Details of the latest version are provided in the MemsONE Corner of the MMC’s Web site. To access this page, please visit the URL <http://www.mmc.or.jp/mems-one/> (Japanese only).