RUMP SESSIONS

Following two Rump Sessions have been organized on September 25 (Thursday).

Session A

"Can power semiconductor technology contribute to sustainable future?"

Organizer: S. Kimura (Hitachi, Ltd., Japan)
Moderator: I. Omura (Toshiba Corp., Japan)

Semiconductor technology advancement has been represented by the large scale integrated circuit, such as CPUs, in terms of nano-meter gate length, billions of transistors, GHz clock frequency and so on, along with the "Moore's law". These technologies have changed the society with the tremendous spread of the internet, the mobile digital equipments and other convenient so-called "on-line" systems and "ubiquitous" equipment all over the world. We do recognize that the success of semiconductor technology in this field has been brought about the human insatiable demand for convenient lifestyle.

Recent discussions on the global scale environmental issues, however, changed the view point to the semiconductor technology. The total electricity consumption of the world has been increased to 16,695 TWh which has already been equivalent to 32 % of total CO_2 emission. This fact implies that we cannot let the electricity consumption increase as we have done in the past, and the wider spread of the higher quality lifestyle to the world will be realized only by the dramatic improvement of efficiency in electric energy use, i.e. the power semiconductor devices have become the key technology for the sustainable future because they have the potential to improve the efficiency of power supply systems and motor drive systems dramatically.

In this rump session, we will discuss the status quo and prospect of the power semiconductors including new semiconductor materials, which has not been concentrated in SSDM sessions ever, and discuss the contribution of

the advanced Si devices and materials technologies to the future high efficient power semiconductors in contrast to the contribution of the compound semiconductors such as SiC and GaN in power devices and power electronics technologies.

Session B

"Nano-Device and Materials Innovations: What novel systems are you dreaming of?"

Organizers: Y. Horiike (NIMS, Japan)
K. Wada (Univ. of Tokyo, Japan)

Year 2008 celebrates 40th anniversary of SSDM. When we look back 40 years ago, the first Si integrated circuits demonstrated by R. Noyce et al. were just 7 years old. The ICs together with a Boolean Algebra have been a strong foundation of the present advanced information society. However, the progress seems slowing down and something extremely disruptive needs to be implemented to sustain our quality of life. There have been quite a few number of research activities currently being done to innovate devices, materials, and system architectures. In the present rump session, we will set up a table to get you updated with potential candidates - challenges and opportunities. Topics will be solicited, conventional Si and beyond.