Future Trends in Memory Developments: Challenges and Perspective

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Conventional semiconductor memory devices such as DRAM, SRAM, and Flash memory have successfully evolved in the direction of higher density and performance, as well as low cost. In view of their growing technical complexity, fabrication costs and physical limits, there have been concerns about whether the successful progress in conventional memory can be sustained in the future. At the same time, many research groups and companies have tried to develop new types of memories to overcome the limits of conventional memory and to realize an ideal memory characterized by non-volatility, high density, high speed and low power consumption. In this talk, I will present the technical challenges facing future trends in conventional memories. I will also discuss the prospects of emerging memories based on CMOS technologies such as FRAM, MRAM, and phase-change RAM (PRAM).