

2013 Symposia on VLSI Circuits Short Course

(Suzaku I)

Tuesday, June 11

9:30-10:30 Discrete-Charge-Induced Variability in MOS Transistors

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Abstract

For years, variability due to random dopant fluctuation (RDF) has been a major issue for SRAM design. More recently, random telegraph noise (RTN) and bias-temperature instability (BTI) are recognized as additional complex time-dependent variability, that may degrade the reliability of circuits in the future. All of these can be classified as discrete-charge-induced variability, which is caused by random placement of charge in the devices. In this talk, the variability will be discussed in the aim of providing an overview on these phenomena.

Biography

Kiyoshi Takeuchi received the B.S., M.S., and Ph.D. degrees from the University of Tokyo, Tokyo, Japan, in 1984, 1986, and 1989, respectively. Since 1989, he has been engaged in the research on high performance CMOS device/circuit design, modeling, and related device physics, with NEC, NEC Electronics, and currently Renesas Electronics Corporation. He was also with Semiconductor Leading Edge Technologies Inc., Tsukuba, Japan to join MIRAI project from 2006 to 2011. His recent research area is device variability and statistical modeling for reliable circuit design. Dr. Takeuchi served as a technical program committee member of International Electron Devices Meeting in 1999, 2000, 2009 and 2010.