

The Status and Future of Metrology: Challenges from the ITRS Metrology Roadmap

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ABSTRACT

The International Technology Roadmap for Semiconductors (ITRS) has provided a picture into the future technology requirements for integrated circuits for about twenty years. The ITRS continues to project these technology requirements for transistor, memories, interconnect, and lithography with a fifteen year horizon. New materials and structures are described as potential solutions to circuit based requirements for future transistors, capacitors, and interconnect. Since the inception of the ITRS, metrology has been challenged by these requirements and the Metrology Roadmap captured these requirements and potential solutions. Frequently, the Metrology Roadmap has indicated that the metrology community does not have a capability that meets key future measurement needs such as critical dimension, overlay, and film thickness. This presentation will cover the near and long term measurement requirements for metrology based on the ITRS and project potential solutions to these needs. The presentation will also discuss advances and gaps in measurement capability for the new materials and structures that the ITRS discusses for Beyond CMOS.

REFERENCES

1. M. P. Brown and K. Austin, *The New Physique*, Publisher City: Publisher Name, 2005, pp. 25-30.
2. M. P. Brown and K. Austin, *Appl. Phys. Letters* **85**, 2503-2504 (2004).