



On imec's MX₂ device platform and MX₂-based dual-gate MOS device operation and charge quantification

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Date: Thursday April 11 @ 11.00 am in BRK 1001

Zoom Link: <https://purdue-edu.zoom.us/j/92955318149>



Abstract:

Two-dimensional materials offer the opportunity to continue the scaling trend on the complementary metal-oxide semiconductor technology road map. In the first part of this seminar we will have an overview of the LAB-to-FAB concept and the wafer-level MX₂ device pathfinder platform at imec including device integration routes, in-line characterization and wafer-level yield and variability analysis. In the second part we will focus on the dual-gate MX₂ MOS devices, in particular the gate stack EOT scaling, capacitance-voltage response, distributed model for 2-D MOSCAPs and the quantification of the charge components in MX₂ MOS devices.

Bio:

Dennis H.C. Lin received the B.S.E.E. from National Taiwan University, Taipei, Taiwan in 1999 and M.S.E.E. and Ph.D. from Purdue University, Indiana in 2000 and 2008. From 2001 to 2003, he was with Bell-Labs & Lucent Technologies in Holmdel, New Jersey developing the ultra-long-haul soliton DWDM (Dense Wave Division Multiplexing) optical communication systems. His Ph.D. work was on GaAs and InGaAs based MOS devices with atomic layer deposited high- κ dielectrics. Since 2009, he has been engaged in gate stack/device research and development for advanced logic applications. He is currently a Principal Member of the Technical Staff in Compute Memory Technologies at IMEC, Belgium.