



SEMINAIRE

de 13 h à 14 h, salle Belledonne, IMEP-LaHC, Bât. BCAi, Minatec,
ouvert à tous : enseignants, étudiants, chercheurs, administratifs, techniciens)

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“All-region MOSFET model: theory and applications”

by Carlos GALUP

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Abstract: Since the MOS transistor is the basic component of modern electronics, a careful presentation of its basic theory will be given. Instead of the usual approach of furnishing separate analytical formulas for the strong and weak inversion regions of the MOS transistor, we provide simple formulas which are valid in all operating regions, including moderate inversion. We will review ultra-low-power circuits that allow the automatic extraction of the specific current I_S and the threshold voltage V_T of MOS transistors, which are fundamental parameters for circuit design and testing, as well as for technology characterization. The design of this class of circuits must be based on all-region MOSFET models since both the drift and the diffusion components of the drain current are important for transistors operating near the threshold condition.

Carlos Galup-Montoro studied engineering sciences at the University of the Republic, Montevideo, Uruguay, and electronic engineering at the National Polytechnic School of Grenoble (INPG), France. He received an engineering degree in electronics in 1979 and a doctorate degree in 1982, both from INPG. From 1982 to 1989 he was with the University of São Paulo, Brazil, where he was engaged in junction field effect transistor (JFET) fabrication and analog circuit design. Since 1990, he has been with the Electrical Engineering Department, Federal University of Santa Catarina, Florianópolis, Brazil where he is now a professor. In the second semester of the academic year 1997/98 he was a research associate with the Analog Mixed Signal Group, Texas A&M University. In the academic year 2008 /09 2009 he was a visiting scholar at UC Berkeley. He is coauthor of the textbooks:



“MOSFET Modeling for Circuit Analysis and Design”, World Scientific, 2007 and “CMOS Analog Design Using All-Region MOSFET Modeling”, Cambridge University Press, 2010.

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