

SEMINAR ANNOUNCEMENT

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

National University of Singapore

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Organised by
Centre for Optoelectronics

14 April 2009 (Tuesday)
E3-06-04, Engineering block E3, NUS

TOPIC (1) :	Physical and electrical properties of hafnium oxide films on AlGaIn/GaN heterostructure grown by pulsed laser deposition
SPEAKER (1)	Ms Tian Feng, Graduate Student Dept of Electrical & Computer Engineering, NUS
TIME (1) :	2.00 pm to 2.50 pm

ABSTRACT (1) :

Good quality insulators with high dielectric constant (high-k) are desirable as the gate dielectric in AlGaIn/GaN metal-insulator-semiconductor heterostructure field effect transistors (MIS-HFETs), as the high-k property helps alleviate the reduction in transconductance and negative shift in threshold voltage in comparison to Schottky gate HFETs (SG-HFETs). In this work, we investigate the physical and electrical properties of HfO₂ films grown by pulsed laser deposition (PLD) technique and the device performance of PLD-grown HfO₂ AlGaIn/GaN MIS-HFETs. SIMS, XPS and C-V measurement results have revealed the high quality of PLD-grown HfO₂ films, such as the compositional uniformity, good film stoichiometry, large conduction band offset of HfO₂/GaN heterostructure, and high-k property. As a result, the fabricated HfO₂ MIS-HFETs exhibit a superior device performance over that of the reference SG-HFETs at both room and elevated temperatures. Our results manifest the good quality of PLD-grown HfO₂ film and its potential as the gate dielectric in MIS-HFETs for high power and high temperature operations.

BIOGRAPHY (1)

Ms. Tian Feng obtained her B.Eng and M.Eng degrees from Department of Material Science and Engineering, Wuhan University of Technology, China in 1998 and 2001 respectively. She is currently pursuing a PhD degree at Center for Optoelectronics, Department of Electrical and Computer Engineering, National University of Singapore. Her research interest focuses on the fabrication and characterization of GaN-based electronic devices.

TOPIC (2) :	System Models and Signal Processing Techniques in Coherent Fiber Optical Communications
SPEAKER (2)	Mr. Zhang Shaoliang, Graduate Student Dept of Electrical & Computer Engineering, NUS
TIME (2):	3.00 pm to 4.00 pm

ABSTRACT (2) :

The interest in coherent fiber optical communication is renewed due to the various benefits: spectrum efficiency (SE) can be increased by $\log_2 M$ when employing higher-order M -ary phase-shift keying (M -ary PSK) and even quadrature amplitude modulation (QAM) modulation formats; besides, the employment of the polarization division multiplexing (PDM) can further increase the SE even without using extra spectrum. Instead of using conventional compensation in optical domain, the signal processing techniques enable us to compensate for the fiber impairments, such as chromatic dispersion, polarization-mode dispersion and phase noise, in electrical domain.

In this talk, we will introduce the equivalent baseband fiber optical channel models first. The commonly-used signal processing techniques in coherent receivers, such as equalizer and phase estimator, will be reviewed.

BIOGRAPHY (2)

Mr. Zhang Shaoliang received his B.Eng Degree from Beijing University of Posts and Telecommunications, Beijing, China, in 2006. Since January, 2007, He has been with Center for Optoelectronics (COE), NUS, as a Ph.D candidate. His current research interest is on coherent fiber optical communications.