

Single Walled Carbon Nanotube Transistors as Building Block for Sensors

by

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Time: 2:00pm- 3:00pm (Refreshment starts at 1:40pm)

Venue: Room B6619, MEEM Conference Room

ABSTRACT

Key aspects of nano sensors, which utilize single walled carbon nanotubes (SWCNTs) as functional building blocks, are ultra small size, room temperature operation and high sensitivity or low limit of detection: the strain dependent piezoresistive gauge factor of a tube in a pressure sensor (40 μm diameter of the pressure sensor membrane) is demonstrated to be 450–700 in the low strain regime; the limit of detection of a NO_2 gas sensor has been shown to be below 100 ppb. Both sensors take advantage of very low power consumption in the range of 1 μW at room temperature. We report on the development, characterization and application of single walled carbon nanotube field-effect transistors as transducers in such sensors. Aspects of device stability are also discussed.

BIOGRAPHY

Christofer Hierold has been a Professor of Micro and Nanosystems at ETH Zurich since April 2002. Currently he heads the Department of Mechanical and Process Engineering of ETH Zurich. Before he joined ETH Zurich in 2002 he was with Siemens AG, Corporate Research, and Infineon Technologies AG in Germany. At ETH Zurich his research is focused on the evaluation of new materials for MEMS, on advanced microsystems, and on nanotransducers. Christofer Hierold has been founding chairman of one of ETH Zurich's inter-departmental competence centers, the Micro and Nano Science Platform, and he initiated the trans-disciplinary Master's program

in Micro and Nanosystems, which is jointly offered by two departments, namely the Department of Mechanical and Process Engineering and the Department of Information Technology and Electrical Engineering. From 2007 until 2009 he was chairman of the management team of ETH Zurich's cleanroom facility, the FIRST lab. Christofer Hierold is a member of the international steering committees of major conferences in the field (MEMS, TRANSDUCERS, EUROSENSORS), co-chair of MEMS2009, and he is a member of the editorial boards of IEEE/ASME Journal of Microelectromechanical Systems and of IoP Journal of Micromechanics and Microengineering, and he is joint editor of the book series Advanced Micro and Nanosystems (Wiley-VCH). Christofer Hierold is member of the Swiss Academy of Engineering Sciences (SATW).

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All are welcome!

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