

M.Sc. Defense
Kevin Miller
DATE: Friday November 5th, 2010
TIME: 10:30a.m.
PLACE: MacNaughton 222
University of Guelph

THESIS TITLE:

X-ray absorption fine structure Studies of Ultrathin nickel silicide films

ABSTRACT:

Structural studies of nano-scale nickel silicides used as contacting materials in CMOS devices provide critical information for device manufacturers. Surface sensitive nickel K-edge X-ray absorption studies of these silicides were conducted at the CLS-HXMA beamline using a rotating sample setup and energy discriminating fluorescence detectors. Absorption data were collected for a series of standards, previously characterized using X-ray diffraction methods, these will allow for both characterization of unknown samples and act as a reference point for further quantitative analysis. Ultrathin epitaxial samples, formed from the deposition of nickel on a silicon substrate followed by a chemical etching and annealing were studied in order to determine their local atomic structure. A characteristic analysis of a pair of fluorine implanted silicide films was performed to determine the most likely phase formed. The technique used to analyze thin film silicides in this thesis proved to be effective, further work on both ultrathin silicide films and implanted silicide films will benefit from the experience gained here.

EXAMINING COMMITTEE:

Chair: Dr. Robert Wickham

Advisor: Dr. DeTong Jiang

Advisory Committee Member(s): Dr. Stefan Kycia, Dr. Xiaorong Qin

