Time & Location: June 21, 2013 at 2:00 PM in HEC 438
Title: Investigation on electrical properties of RF sputtered deposited BCN thin films

The ever increasing advancements in semiconductor technology and continuous scaling of CMOS devices mandate the need for new dielectric materials with low-k values. The interconnect delay can be reduced not only by the resistance of the conductor but also by decreasing the capacitance of dielectric layer. Also cross-talk is a major issue faced by semiconductor industry due to high value of k of the inter-dielectric layer (IDL) in a multilevel wiring scheme in Si ultra large scale integrated circuit (ULSI) devices. In order to reduce the time delay, it is necessary to introduce a wiring metal with low resistivity and a high quality insulating film with a low dielectric constant which leads to a reduction of the wiring capacitance.

Boron carbon nitride (BCN) films are prepared by reactive magnetron sputtering from a B$_4$C target and deposited to make metal-insulator-metal (MIM) sandwich structures using aluminum as the top and bottom electrodes. BCN films are deposited at various N$_2$/Ar gas flow ratios, substrate temperatures and process pressures. The electrical characterization of the MIM devices includes capacitance vs. voltage (C-V), current vs voltage, and breakdown voltage characteristics. The above characterizations are performed as a function of deposition parameters.

Major: Electrical Engineering

Educational Career:
Bachelor's of Electronics and communication, BS, 2011, Visvesvaraya Technological University

Committee in Charge:
Kalpathy B Sundaram, Chair, Electrical Engineering
Jiann S. Yuan, Electrical Engineering
Mingjie Lin, Electrical Engineering

Approved for distribution by Kalpathy B Sundaram, Committee Chair, on June 7, 2013.

The public is welcome to attend.