

M.Sc. Defence

Gabriel Dina

Date: Monday October 24th, 2011

Time: 9:30 a.m.

Location: MacNaughton 222

Title: Laue Monochromator Performance Calculations for a Future Canadian Light Source Diffraction Beamline

Abstract: The computational investigation of perfect and bent crystals both cylindrically and sagittally, have led to the development of sets of optimized parameters to be used for the monochromator being built at the CLS. Using Si in Bragg and Laue geometries, the developed algorithms examine parameter space for most throughput at the crystal. Using programs in XOP, the calculation analysis for a single incident beam revealed that for symmetric flat crystals the reflection (1,1,1) in the Bragg geometry is most preferable for producing the most throughput at energies below 24keV. For cylindrically bent crystals at energies higher than 24keV, a Laue geometry is more preferred as a result of an increase in the rocking curve width and throughput. Development of a program that accounts for multiple incident beams and calculates the diffracted intensity and energy resolution at the monochromator using a saddle bent Laue crystal are presented here.

Examining Committee:

Chair: Robert Wickham

Advisor: Stefan Kycia

De-Tong Jiang