University of Victoria | Graduate Studies

Notice of the Final Oral Examination
for the Degree of Master of Science

of

FERNANDO MALDONADO MILLAN

BSc (Universidad Autonoma de Yucatan, 2013)

"Extraction Optics for Ion Beam Generation in the ARIEL Facility at TRIUMF"

Department of Physics and Astronomy

Monday, September 12, 2016
4:00 P.M.
Elliott Building
Room 105

Supervisory Committee:
Dr. Dean Karlen, Department of Physics and Astronomy, University of Victoria (Co-Supervisor)
Dr. Alexander Gottberg, Department of Physics and Astronomy, UVic (Co-Supervisor)
Dr. Michel Lefebvre, Department of Physics and Astronomy, UVic (Member)

External Examiner:
Dr. Ben Nadler, Department of Mechanical Engineering, UVic

Chair of Oral Examination:
Dr. Sandra Gibbons, School of Exercise, Science, Physical & Health Education, UVic

Dr. David Capson, Dean, Faculty of Graduate Studies

Abstract

The proposed ion optics extraction geometry from ARIEL has been optimized based on simulations with Comsol. Geometrical parameters such as the acceleration gap and angle of the face of the vacuum chamber were studied in order to improve the beam 4-emittance and beam spot size. For geometries of interest, additional studies have been performed: voltage dependence, mass dependence, and the effect of the ion source misalignment on the beam parameters and how to compensate them. Simulations and experimental measurements were also performed for the current ISAC surface ion source to corroborate the simulation results.