



Contribution ID: 173

Type: **Poster**

## ARIEL E-linac Vacuum System

*Tuesday 19 June 2018 18:00 (20 minutes)*

The new Advanced Rare Isotope Laboratory (ARIEL) is TRIUMF's flagship facility that will expand Canada's capabilities to produce and study isotopes for physics and medicine. Utilizing next-generation technology, it will showcase a made-in-Canada, high-power superconducting electron accelerator to produce exotic isotopes for research and development.

ARIEL will produce radioactive isotopes by bombarding actinide targets with high energy electron beam, generated by an electron gun (EGUN) and accelerated with an electron linear accelerator (E-linac). The E-linac is comprised of an EGUN, three main accelerators, and beam transport lines delivering the beam to a beam dump or to ARIEL targets. To minimize the collision of electrons with air molecules, the E-linac requires an evacuated volume along the electrons path. When beam is running, the pressure in the EGUN has to be at level less than  $1\text{E-}9$  mbar, in the three accelerators and the section between the accelerators at level less than  $1\text{E-}8$  mbar, and in the beam transport lines which deliver beam to the targets or beam dump at level less than  $1\text{E-}7$  mbar.

The Vacuum System of the E-linac provides an environment with reduced pressure for electron beam acceleration. To achieve this goal, the vacuum system has to comply with Ultra High (UHV) and High (HV) vacuum manufacturing and assembly standards. Careful choice of materials and purchased vacuum components, their cleanliness, assembly, and handling will assure that the requirement is met.

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**Session Classification:** Poster Session Tuesday

**Track Classification:** Vacuum in Accelerators