Canadian Association of Physicists
Association canadienne des physiciens et physiciennes

Contribution ID: **4242** Type: **Oral (Non-Student) / Orale (non-étudiant(e))**

A Canadian Accelerator Contribution to the Electron Ion Collider

Tuesday 28 May 2024 11:00 (15 minutes)

The Electron-Ion Collider (EIC) is a new US$2.5B particle collider facility to be built at Brookhaven National Laboratory (BNL), on Long Island, New York, by the US Department of Energy (US-DOE). The EIC is the next discovery machine offering high science impact but with significant technical challenges. In the 2022–2026 Canadian Subatomic Physics Long Range Plan, the community named the EIC as a "flagship program with broad outcomes."Similar to Canadian involvement in other large international science projects of global scale like the High Luminosity upgrade at CERN, we anticipate delivering key enabling components, expanding on existing Canadian strengths in particle accelerator technology. Canada, through expertise at TRIUMF, has significant relevant experience in superconducting radio-frequency (SRF) technology. Through discussions with EIC, we have identified an in-kind contribution with high technical complexity that would provide a significant and challenging deliverable to the EIC project. The scope consists of the design and production of 394-MHz crab cavities and cryomodules that will increase the probability of collision of the circulating beams and are essential for reaching the scientific aims of the EIC. The present layout of the EIC foresees two 394MHz cavities per interaction point per side for the Hadron Storage Ring (HSR), and one 394MHz cavity per IP per side for the Electron Storage Ring (ESR). TRIUMF's experience in SRF technology is already being exploited to supply similar cryomodules to the high luminosity upgrade project at CERN. The EIC deliverables will expand Canada's core competencies in accelerator technology benefitting fundamental research and industry. TRIUMF is presently engaged in design studies on the 394MHz cavities. The presentation will briefly summarize the existing TRIUMF SRF program in supporting international accelerator projects and present the proposed contribution to the EIC.

Keyword-1

accelerator

Keyword-2

superconducting

Keyword-3

EIC

Author: LAXDAL, Robert Edward

Co-authors: Prof. HORNIDGE, David (Mount Allison University); Prof. HUBER, Garth; Dr SMITH, Nigel (TRIUMF); Prof. KESTER, Oliver (TRIUMF); KOLB, Philipp (TRIUMF); JUNGINGER, Tobias (University of Victoria); DECONINCK, Wouter; YAO, Zhongyuan (TRIUMF)

Presenter: LAXDAL, Robert Edward

Session Classification: (DNP) T1-4 EIC Physics | Physique EIC (DPN)

Track Classification: Technical Sessions / Sessions techniques: Nuclear Physics / Physique nucléaire (DNP-DPN)