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TRIUMF's H– Ion Source Development to Date

TRIUMF's 500 MeV cyclotron has been powered by an arc discharge H– ion source developed in-house 30 years ago. Since then, new additions to TRIUMF, like ISAC, have required increasing amounts of beam current from the cyclotron. The ARIEL facility will also require an additional 100 μA, in addition to the existing 300 μA required by the current beam lines. To meet the growing intensity demands of experiments, improvements in the source beam current and brightness are necessary. Due to historical reasons, the initial beam energy has been limited to 12 keV and the power to the source filament is limited to 2.5 kW. Therefore, the need for a state-of-the-art new ion source has become an increasingly prominent concern. This new source will be designed to produce a high-brightness 25 keV H– beam with a long filament lifetime. A historical overview of source development at TRIUMF will be presented, specifically regarding the new filament design, optimization multi-cusps, filter fields, and recent results from the ion source test bench.

Funding Agency

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I have read the Code of Conduct to attend ICIS2023.

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