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Characterization of H^- Ion Source for the New Ion Source Terminal at TRIUMF

TRIUMF's 500 MeV cyclotron has been fed by an arc discharge H^- ion source developed in-house 30 years ago. Since then, the existing rare isotope facility ISAC and the new rare isotope facility ARIEL in TRIUMF have required more and more proton beam current from the cyclotron. To satisfy the growing intensity of proton beams from cyclotron, the ion source beam current and brightness needed to be improved. The need for a state-of-the-art new ion source became an increasingly prominent concern. A new H^- source is under developments to produce a high brightness H^- beam with a long filament life for the new ion source injection terminal (I2) in addition to the existing terminal (I1). At present the source being characterized in our test bench equipped with an emittance scanner and beam intensity measuring devices, and source characterization is well underway. The paper will describe the recent results from the source characterizations at the test bench.

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