

**MISTIC: RADIATION HARD ECRIS**

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**Abstract**

The ISAC RIB facility at TRIUMF utilizes up to  $100 \mu\text{A}$  from the 500 MeV  $\text{H}^-$  cyclotron to produce RIB using the ISOL method. At the moment, a hot surface, a laser and a FEBIAD ion source are used to produce RIB. These ion sources are not suitable for gaseous elements like Ne, C, O, N and F which are key nuclei in nuclear astrophysics research at TRIUMF. However, these elements can be ionized efficiently by an ECRIS. By combining a high frequency electromagnetic wave and a magnetic confinement, the ECRIS can produce high energy electrons essential for efficient ionization of these elements. To this end, a prototype ECRIS called MISTIC (Monocharged Ion Source for TRIUMF and ISAC Complex) has been built at TRIUMF using a design similar to the one developed at GANIL [1]. Conventional ECRIS cannot be used at ISAC because of the high radiation field created when high energy proton beam impinges the target. In order to achieve a radiation hard ion source, electromagnetic coils replace the permanent magnets. Preliminary tests for Ne, Kr and Xe showed that MISTIC is very stable over a large range of frequencies, magnetic field configurations and pressures.

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