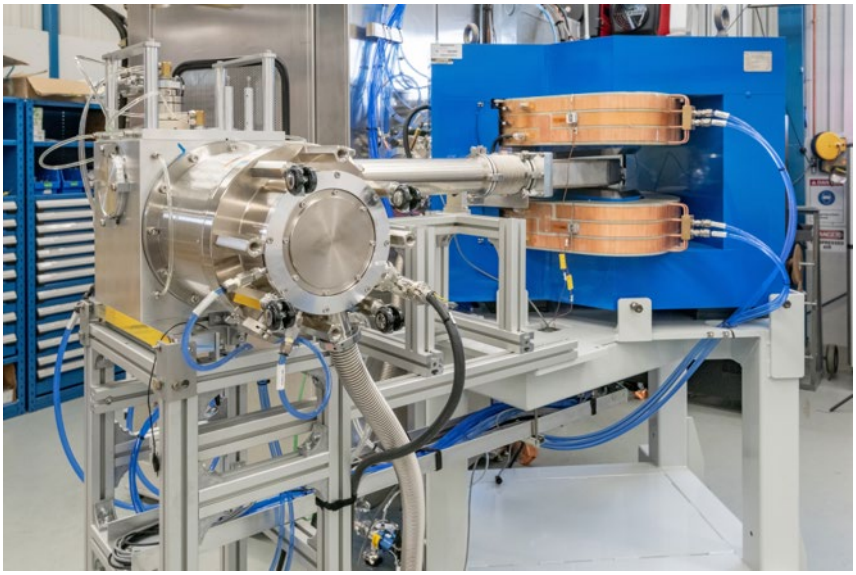
2.45 GHz ECR ION SOURCE, TURNKEY SYSTEM

IS.ECR-020

Neutron Therapeutics-licensed[1] electron cyclotron resonance ion source.

- **High current ion source for monocharged ions**
- **Three solenoid configuration enables fine tuning of magnetic field and plasma confinement**
- **Moveable extractor for wide beam energy range (40-60 kV)**
- **All supporting sub-systems to produce reliable ion beams**
- **Instrumentation options include Faraday cup, emittance scanner, beamlines, beam profilers and mass spectrometer**



ECR Ion Source Turnkey System (IS.ECR-020)

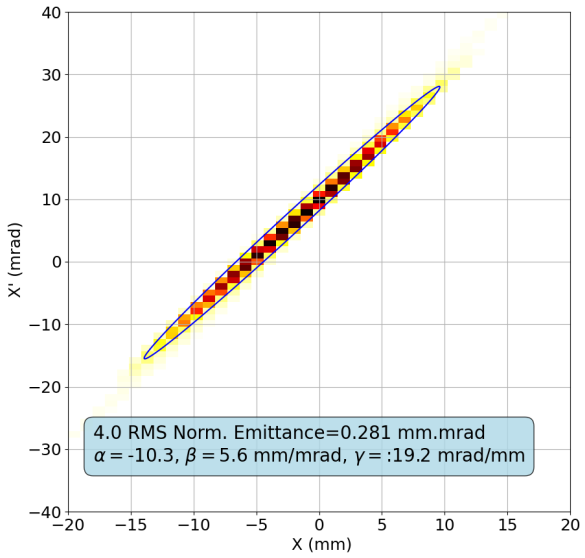
SPECIFICATION: IS.ECR-020	
ION SOURCE CHARACTERISTICS	
Particle Types	H^+, H_2^+, He^+, D^+, Kr and most gaseous ions
Frequency	2.4-2.5 GHz
Beam Current Stability	± 1% over 24 hours
EMITTANCE CHARACTERISTICS FOR H^+ (60 keV)	
Geometric Emittance (1RMS)	< 10 mm·mrad
Normalized Emittance (1RMS)	< 0.15 mm·mrad
Distribution	Gaussian
POWER SUPPLIES	
Microwave Generator	50 VDC, 1.6 kW
Max Bias Supply	125 mA, 80 kV
Suppression System	60 mA, -5 kV
Solenoid (3x)	110 A, 10 V
VACUUM SYSTEM SPECIFICATIONS	
Turbo Pump	2300 l/s Flange ISO250F
Roughing Pump	36 m^3/hr
GAS FLOW	
Mass Flow Controller	0-3 sccm of H_2
CONTROLS	
Controller	Allen-Bradley PLC
HMI	Custom web-based interface
EPICS	EPICS compatible
Safeguards	Designed in accordance with ISO 13849

ION	Maximum Beam Current (mA)	Beam Energy (keV)
H^+	30	40-60
H_2^+	5	40-60
D^+	30 (est.)[2]	40-60
He^+	30	40-60
Kr^+	5	40-60

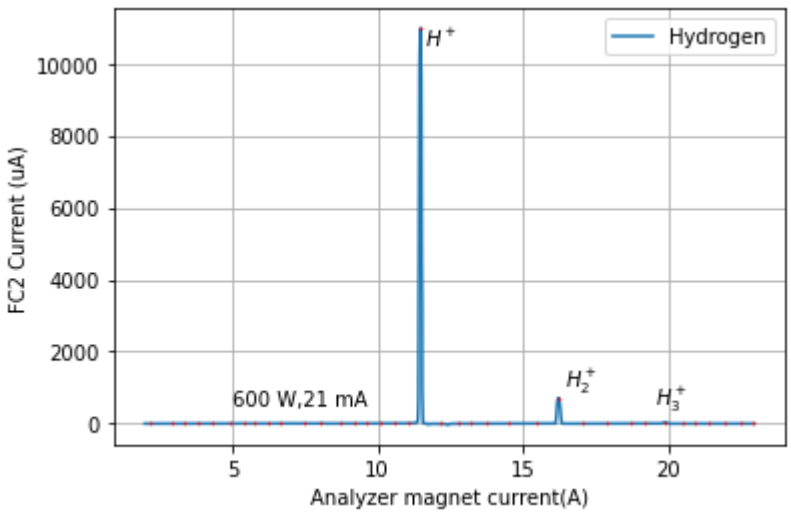
Commercially Available Ions, Currents, and Kinetic Energies. Maximum beam currents are achieved using different ion source configurations for different species.

**All beam specifications listed are for a fully conditioned ion source system*

1. ECR technology is licenced from Neutron Therapeutics
2. Estimate - Unable to measure due to neutrons released from D-D reaction in Faraday Cup.



Emittance data for 60 keV, 30 mA hydrogen beam showing 4RMS Twiss parameters



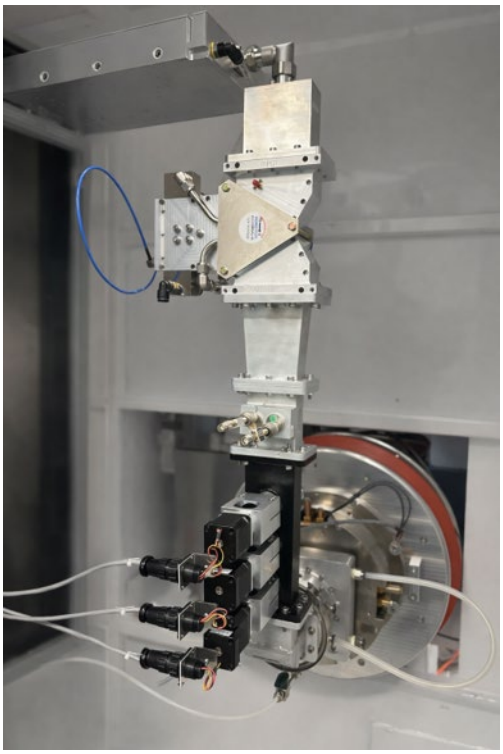
Mass spectrometer data showing beam composition of ECR beam extracted from H_2 plasma optimized for H^+ extraction.

<u>The IS.ECR-020 ECR Ion Source system is a complete turnkey ion source system including:</u>

- Ion Source & Vacuum Box
- RF Amplifier & Impedance Matching Systems
- Vacuum System & Gauges
- Power Supplies, PLC Controls & Software
- Interlocks and HV Grounding System
- User Interface & Ethernet-Based Remote Controls
- Water Flow Gauges and Interlocks
- Mass Flow Controller for Feed Gasses
- High-Voltage Enclosure/Ion Source Stand
- Water De-Ionization and Cooling System
- Retractable Faraday Cup
- Personnel Access Control Interlocks

<u>Optional add-ons to Turnkey system IS.ECR-020</u>

- Mass Spectrometer with Resolution Slits
- Additional LEBT Components
- Steering, Solenoid/Quadrupole Focusing System Downstream of Source
- TRIUMF Licenced Allison-Type Emittance Scanner
- UniBEaM Fiber Optic Beam Profile Monitor or Scanning Slit Beam Profiler



ECR Ion Source (IS.ECR-010)

Enquire about other ion beams from this source.