ENHANCED BEAM INJECTION FOR HIAF

SNEAP 2021
ANU HIAF 14UD

NEC Pelletron
10+1 end stations lines across two target areas
LINAC superconducting booster
Two ion sources
Ion sources

SSNCIS source
Single sample modified NEC source
Gas or solid cathode sample
Ion sources

**MSNICS source**

32 sample NEC source

Reserved for AMS applications
Motivation

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2. Users are demanding 3He and 4He (alpha particles) for research problems
   » New ion (alpha) source
The project

1. Installation of a new 110° electrostatic analyser (ESA)
2. Installation of a new ion source to produce negative helium ions (ECR/RB ion source)
3. Repositioning the existing multi-cathode MSNICS ion source to integrate with the ESA
4. Plus additional associated work
5. Installation of new safety cages around all three ion sources
6. Reconfiguration and upgrade of the high-voltage functional safety interlock system
1. Improved isotope tracing in environmental applications;
2. Assessment of detectors for dark matter searches;
3. Searches for interstellar particle influx to the Earth;
4. New research into the quantum mechanics of nuclei and;
5. New astrophysics and medical applications.
Existing layout
Planned layout
NEC Proposal
Integration
ECR source

Pantechnik Monogan M-100
2.45 GHz 30W RF
Rubidium charge exchange cell

ECR source

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Control and I/O

Integration into existing EPICS control
ADAM-5000 Series Modular I/O System
ESA bouncing system (AccelNet)
Functional safety systems

Many applicable standards including:

AS/NZS 4024 Series (Safety of Machinery)

Timeline and challenges

Original planned delivery in October 2020

But COVID

System design finalised

Building infrastructure upgrades

Electrical distribution board upgrades

Physical repairs
THANK YOU