NSCL

THE GREENSHEET

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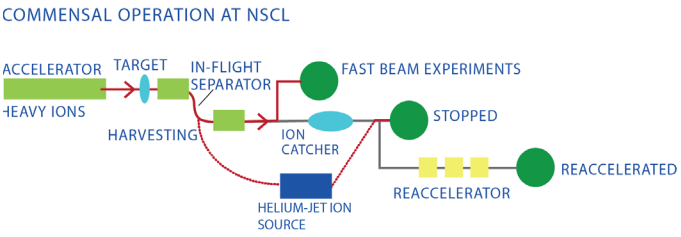
A HELIUM-JET ION-SOURCE FOR COMMENSAL OPERATION AT NSCL

Contributed by: Remco Zegers, JJ Das, Georg Bollen, Andreas Stolz and Antonio Villari

At present, beams of rare isotopes produced by fast fragmentation can only be used in a single experimental end station at NSCL. The Helium-Jet Ion Source (HJIS) project is aimed at delivering a beam of rare isotopes to a secondary experimental end station by collecting isotopes discarded in the production of the rare-isotope beam for the primary experiment. This so-called commensal mode of operation would allow for simultaneously conducting a fast-beam experiment (e.g. with MoNA-LISA, the S800 or a decay station) and an experiment with stopped or reaccelerated beams.

The collection of discarded rare isotopes will take place in a high-pressure off-axis stopping cell in the A1900 fragment separator. The cell is filled with helium that is saturated with aerosols to which the rare isotopes attach. The aerosol/helium mixture is transported through a capillary (tens of meters long) to an extraction system and ion source, which will be placed on the roof of the N1 vault. The extracted rare isotopes are then accelerated to 60 keV and purified in separator magnet. The goal is to transport the rare isotopes to one of the low-energy experimental end stations or the reaccelerator, as shown in the schematic picture.



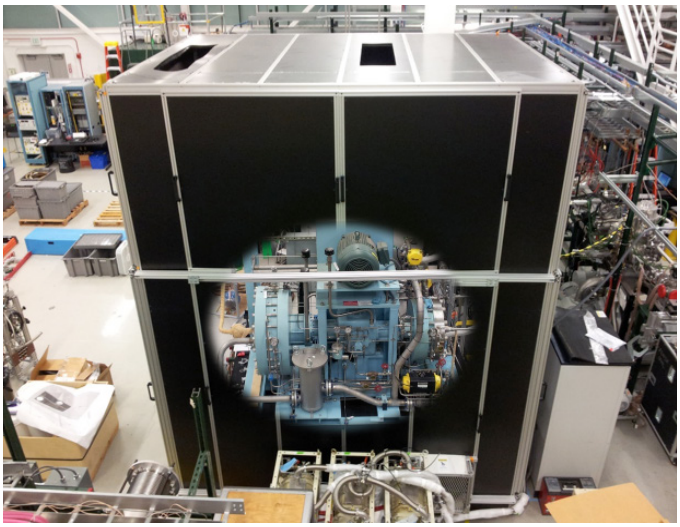
Schematic depiction of the operation of the HJ-IS for simultaneously delivering beams of rare isotopes to two experimental stations at NSCL.

NSCL was awarded a three year MRI grant from NSF to install and develop the HJIS for operations at the Laboratory. The basic components of the HJIS were shipped (last December) from ORNL where it was developed and tested using Californium fission source by a collaboration of ORNL, the UNIRIB consortium, Rutgers University, and NSCL. Installation has begun above the N1 vault.

HOW THE NEW BIG BOX IN REA3 HIGH BAY HELPED TO STUDY OXYGEN-17

Contributed by: Konrad Schmidt

In the ReA3 high bay there are several noise sources present that increase the sound level. Since the Jet Experiments in Nuclear Structure and Astrophysics (JENSA) compressor was recognised as one of the central noise sources (about 80dBA) in the room, acoustic insulation was installed this January. This helps to reduce the sound level and enabled a better working environment in the high bay.The noise enclosure uses noise absorbing pads which surround the JENSA gas jet target.



The new 14.3 cubic feet big box in the ReA3 high bay reduces the noise of the JENSA compressor (indicated in the center).

The noise enclosure helped during the commissing run of the JENSA gas jet target in late February. The group was able to observe the running gas system the whole time during the experiment, noting pressures, temperatures, and flows.

The experiment used a stable nitrogen-14 beam from ReA3 which hit the gas jet target. This enabled the measurement of the well-known reaction cross section in both p0 and p1 channels of the ^{14}N(α,pγ)oxygen-17 reaction. For the first time, the Silicon Detector Array (SIDAR), the Super Oak Ridge Rutgers University Barrel Array (superORRUBA), and the Hybrid Array of Gamma Ray Detectors (HAGRID) were combined to measure scattered α particles as well as protons and γ rays successfully.

LABORATORY UPDATE

This week, the cyclotrons continue to run beam for a Reaccelerator experiment that began last Thursday. calcium-40 beam serves to produce the potassium istope K-37, which is thermalized in the Gas Cell and sent to ReA for acceleration. The experiment continues to take data with the ANASEN detector, which has been set up on the general purpose beamline of ReA.

COMPLACENCY: THE ADVERSARY OF SAFETY

The term complacency has several definitions; perhaps the one most suitable in the context of safety is, "a feeling of quiet pleasure or security, often while unaware of some potential danger or defect". Ironically, this feeling can develop from a perception that you live and work in a safe environment - an environment where few workplace incidents occur and when an incident does occur, it is often of a minor nature. The message here is, never let your guard down.

Ways to maintain our safety:

- Follow established protocols and procedures;
- Have daily safety meetings to discuss changes and potential hazards that develop from day to day;
- Wear the appropriate PPE for the task at hand;
- Complete or review a JSA before starting a task;
- Take a "Four Second Reset" to stop and think about the safety side of the task you're about to start;
- Manage your "Zone of Control" in your workspace: identify and eliminate or control hazards; maintain housekeeping and organization;
- Report any and all perceived or potential hazards;
- Report all near misses. They help us collect information, identify trends, correct current problems, and prevent future incidents and injuries from happening;
- Coach, mentor and watch out for each other throughout the day.

A level of safety in the workplace where incidents are indeed a rare occurrence, does not guarantee future success, however it is an indication of a strong safety culture. It's up to all of us to never let our guard down. Continuous safety maintenance is the backbone of a strong safety culture and a truly safe workplace.

SEMINARS

- MONDAY, MAR 21 AT 10:00 AM
  NSCL Lecture Hall
  Brian Bucher, LLNL
  'First Direct Measurement of Octupole Strength in Radioactive Ba Isotopes'
- TUESDAY, MAR 22 AT 11:00 AM
  NSCL Lecture Hall
  Derek Neben, NSCL
  'Ion Confinement and Electron Temperature in an Electron Cyclotron Resonance (ECR) Ion Source'
- WEDNESDAY, MAR 23 AT 10:00 AM
  NSCL Lecture Hall
  Gregory Severin, Technical University Denmark
  'Unconventional Radiometals In Preclinical Research: Production, Purification, And Application'
- THURSDAY, MAR 24 AT 11:00 AM
  NSCL Lecture Hall
  Agnes Mocsy, Yale University, Pratt Institute
  'Who Is Doing Science? Who Isn't, And Why?'
- THURSDAY, MAR 24 AT 3:00 PM
  NSCL Lecture Hall
  Yue Hao, BNL
  'Accelerator Physics Advance towards Future Electron Ion Collider'

PEOPLE AT THE LAB

- James Thelen is a Mechanical Assembly Technician who joined the lab this week, Bojan Durickovic is his line manager
- Joe Whaley is a SRF Process Engineer I who joined the Cavity Processing & Cold Mass Assembly Group, under the line management of Ian Malloch.

THE ARCHIVE FOR PREVIOUS GREENSHEETS IS AVAILABLE HERE

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