THE ARGONNE TARGET LIBRARY

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THE ARGONNE TARGET LIBRARY

ABSTRACT

As part of the proposal to DOE-NP for the Center for Accelerator Target Science (CATS) initiative, one of the objectives was to develop an inventory of existing targets that will serve as a pool available to the community. Targets collections have been recovered from Yale University due to the closing of their Tandem Accelerator Facility. In addition, accumulated targets from target preparation in the Physics Division over several decades have also been assembled with the intent of providing them to whomever would have a use for them. Space has now become available to compile, catalog and house these collections. Thus, the Argonne Target Library has been established and its progress and outlook will be discussed in detail.
• INTRODUCTION AND MOTIVATION
  • CENTER FOR ACCELERATOR TARGET SCIENCE (CATS)
  • THE CLOSING OF THE YALE TANDEM
  • THE PHYSICS DIVISION TARGET COLLECTION

• THE ARGONNE TARGET LIBRARY
  • SPACE ESTABLISHED
  • FURNISHINGS FOUND
  • THE PHYSICS DIVISION TARGET ARCHIVES

• THE COLLECTIONS
  • THE WRIGHT NUCLEAR STRUCTURE LABORATORY
  • THE PHYSICS DIVISION TARGET LABORATORY
  • VARIOUS MISCELLANEOUS COLLECTIONS

• CURRENT PROGRESS AND OUTLOOK
  • RECONSTITUTING THE YALE TARGETS
  • FINISH CATALOGING THE COLLECTIONS
  • TARGET LIBRARY OPERATIONS AND WEBSITE

• CONCLUSION
INTRODUCTION AND MOTIVATION

Let’s pose the question “Why a Target Library?”

- During the course of ATLAS target preparation – many targets are produced.
  - at first as “practice” depositions employing stable materials
  - when using isotope – as many targets as possible are made

- These targets naturally accumulate – plus targets brought here.
  - perhaps to be used again in future experiments
  - loathe to throw any targets away (especially isotope!)

- Many target laboratories therefore have large supplies of “unused” targets
  - 30 years ago – Thomas remarked “why don’t we have a listing and make these targets available?”
  - during the ‘90’s Folger @ GSI built an indexing target storage system

- On a very small scale some of these targets have been made available
  - former ANL colleagues (and others) have periodically been provided targets
  - and we entertain making new targets (on a case-by-case basis)
INTRODUCTION AND MOTIVATION

“In Addition …”

- Due to budget cuts many Accelerator Facilities have ceased operations.
  - forcing some former “target labs” to also shut down
  - responsible folks have realized the value keeping their target collections

- Labs with AND without target making capabilities have benefitted.
  - from obtaining these targets for re-use
  - but, for the most part, these collections are generally unknown

- This has recently been discovered in the case of the WNSL Tandem closing.
  - the Yale target lab was cleaned out and many targets recovered
  - several collections of targets were also obtained (for re-use?)

- One objective of the CATS Proposal would be to collect such targets.
  - develop an inventory of these target collections
  - make them available as a pool to the low-energy community
INTRODUCTION AND MOTIVATION

Center for Accelerator Target Science (CATS)

- It was proposed to create a National Center for Accelerator Target Science (CATS) based on the existing target development laboratory at ANL.

- The objectives of the center are as follows:
  1. Serve the low-energy community by producing targets whenever possible by either manufacturing them or by directing requests to other facilities best able to perform the task
  2. Train individual investigators and students in target making in order to provide a workforce capable to address present and future needs
  3. Carry out R&D activities dedicated to novel production techniques and optimization of existing ones
  4. Develop an inventory of existing targets that will serve as a pool available to the community
INTRODUCTION AND MOTIVATION

The Closing of the Yale Tandem

- Three days (Dec. 2013) were spent at WNSL (Yale U.) to organize the target facilities and recover whatever targets might be worth saving.
- Many of these targets originated in the PHY Division Target Lab!

Physics Div. targets returned to ANL

Organized into targets worth saving. Returned to ANL
INTRODUCTION AND MOTIVATION

The Closing of the Yale Tandem

- In addition, at Yale, there were ALREADY collections of targets from both Brookhaven (BNL) as well as Los Alamos (LANL).
- These were carefully packed and shipped to ANL.
INTRODUCTION AND MOTIVATION

The Physics Division Target Collections

- Three decades of target production in support of ATLAS experiments have accumulated into a formidable inventory and currently reside in M-057 storage.
- In addition, a large collection of stable “practice” target preparations also exists in the Target Lab R-150, along with targets we intend to keep in “circulation.”
- We plan to use the Yale collections as a learning “Test Bed” for the cataloging and handling of this large target inventory.

Argonne targets stored in M-057
THE ARGONNE TARGET LIBRARY

Space Established

- Room P-114 The 3 MeV Van de Graaff Control Room
- As we first found things
THE ARGONNE TARGET LIBRARY
Space Established

- Cleaned out and floors waxed
- New LED Lighting
THE ARGONNE TARGET LIBRARY

Furnishings Found

- Shelving and cabinets for target collections
- Wall units for Target Archives
- Furniture, desks and bench workspace
THE ARGONNE TARGET LIBRARY
The Library Layout

- Shelving and cabinets for target collections
- 6 Cabinets (WNSL & Yale Targets)
- 8 set of shelves (ANL Targets)
- 3 Sets of glass cabinets (future)
THE COLLECTIONS
The Wright Nuclear Structure Laboratory

- Unpacking, sorting and reconstituting the various collections shipped to ANL from the WNSL.
- New network connection and computer desk for target cataloging.

Unpacking the shipments from WSNL

Entering the Yale targets into the database
THE COLLECTIONS
The Wright Nuclear Structure Laboratory

- In addition to the targets we expected, we were surprised to discover another cabinet worth of various miscellaneous targets and foils.
- This collection had not previously been archived or cataloged at Yale and included numerous glass desiccators containing targets.

Various miscellaneous targets and glass desiccators shipped to ANL from Yale
THE COLLECTIONS

The Physics Division Target Laboratory

- The Physics Division Target Collections have yet to be cataloged.
- In the process of beginning to compile these now.

Argonne targets still needed to be organized and compiled.
THE COLLECTIONS
Various Miscellaneous Collections

- NSCL (MSU)
- Daresbury
- MicroBall (Wash. U.)
- Osaka, Munich, etc.
CURRENT PROGRESS AND OUTLOOK

Reconstituting the Yale targets

- The BNL Target Collection (now at ANL)

Roughly 338 targets
CURRENT PROGRESS AND OUTLOOK

Reconstituting the Yale targets

- The LANL Target Collection (now at ANL)

Roughly 920 targets
CURRENT PROGRESS AND OUTLOOK

Reconstituting the Yale targets

- The Yale Target Collections (Now at ANL)

Misc. Yale targets
Y001-Y166 already cataloged

Yale target “groups” awaiting compilation
CURRENT PROGRESS AND OUTLOOK

Finish Cataloging the Collections

- The Collections so far …
  - WNSL Brookhaven targets.pdf
  - WNSL Los Alamos Targets.pdf
  - Misc. Yale targets.mdb

- Still need to be compiled …
  - Yale target Groups.xls
  - Argonne targets Groups.xls
  - Misc. Argonne targets.mdb
  - Misc. Other targets.doc

- May standardize perhaps on .pdf’s
  - Investigate library software
  - Or some other database

Argonne targets still needed to be organized and compiled
CURRENT PROGRESS AND OUTLOOK

Target Library Operations and Website

- LIBRARY RULES
  - Proposed…
    i) individual target requests will be limited to one specified target and up to two targets shipped if possible – (one for a spare).
    ii) priority will be assigned to domestic requests and of those, being DOE (& NSF) investigators will be addressed first.
    iii) wherever possible a user supplied FedEx account will be needed for shipping.
    iv) a vacuum target transport container may be necessary (such as those marketed by MicroFoils, Inc.)— it should be supplied in advance by the requestor.
    v) any future approved rules employed as they arise.
  - Visitors
    • Controlled access?

nothing has been finalized …
CURRENT PROGRESS AND OUTLOOK

Target Library Operations and Website

- New CATS website
- Build out happening now
- Should link to the Library
- From there to the Collections
- Also from www.INTDS.org

In the end the success of this Library Project will depend on

COMMUNICATION:
- This talk
- INTDS2018 (MSU)
- Website
CONCLUSION

- In conclusion, the Argonne Target Library is now coming online. Once the catalogued collections are compiled and completed, they should become rapidly available through a link from the CATS website. We anticipate a slow and steady demand for these targets once established. The mechanism for target check-out should quickly be realized once underway. Hopefully, this vast wealth of unused targets may again become available to the low-energy community for use in nuclear physics experiments.
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