# EPICS APPLICATIONS IN THE CONTROL OF SPES TARGET LABORATORY



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**SPES (Selective Production of Exotic Species): a new project at LNL** 

**Aim**: RIB (Radioactive Ion Beam) production by proton induced fission on a UCx target [1]

Re-acceleration performed by the LNL superconducting Linac
 Neutron rich nuclei will be available at energies up to 13

MeV/u in the mass region A=130.

## Key components:

□ Primary (proton) beam accelerator: commercial cyclotron with energy up to 70MeV, 200 uA

□ Multi-disk, direct target (ISOL method)

# The SPES Target and Ion source

### **Target concept:**

- □ Multifoil structure to optimize the release time
- □ Best extraction efficiency measured at 2200C
- □ Heating power delivered by the incident beam (8KW foreseen) and ohmic dissipation.



### **Milestones:**

Cyclotron ordered in september 2010, delivery for end 2013
 Building construction will start at end 2011, two years foreseen for completion.

□ First run (without re-acceleration) scheduled for 2014

### **Development status:**

- □ Prototype construction completed
- **D** Beam extraction tests in progress with ohmic heating only

# Hardware & Software for Controls

EPICS chosen for software development [2	2]:
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- Most IOCs running under LINUX (Debian or CentOS)
   Serial communication drivers based on "stream device" model
- (i.e. Control of LAMBDAPS)
- □ Analog and digital MicroIOCs (by Cosylab) used for the control of H.V. power supplies.
- □ VME controllers (VME3100) running under VxWorks used for beam diagnostics.

# **Basic Instrumentation**

- High current power supplies (1300 A) for target heating (LAMBDA GENESYS series)
   HV power supplies (ULTRAVOLT) for electrostatic deflectors biasing (three quadrupoles)
- □ HV power supply (FUG) for feeding the insulated target chamber
- Pyrometers for temperature measurement
- □ Vacuum pumps and meters
- Beam diagnostics system.

### **Operator Interface**

Initial developments using MEDM
 LabView successfully tested using SNS method [3]
 CSS chosen for current and future developments

### **The Channel Archiver**

Current configuration works in conjunction with mySQL
 Non distributed DB, acceptable performance.

Graphic interface implemented in CSS (see example below)

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# Network Services Gateway DHCP Firewall Backup (based on NAS) Nagios CVS and Wiki server PXE boot server



# The HyperArchiver Project

- Based on Hypertable [4] (by Zvents); non RDB
   Available under GNU license
- Distributed, can manage large data sets
- □ Faster than mySQL and Oracle
- □ Work in collaboration with BNL and SNS [5]