

GRETINA Status



I-Yang Lee

GRETINA Software Working Group Meeting

LBNL, June 22-23, 2004

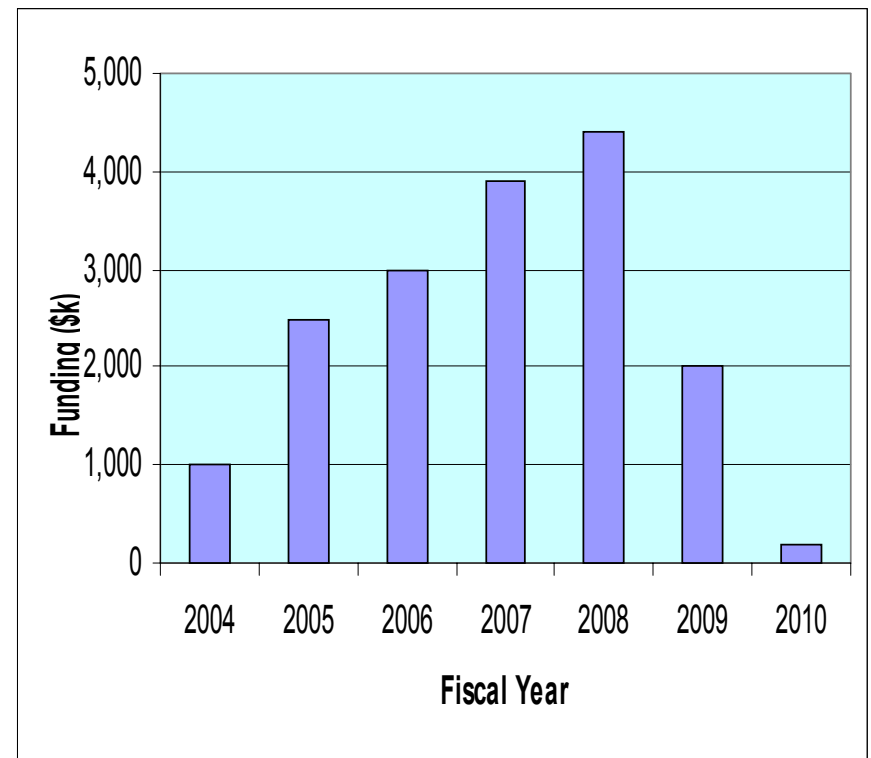
Recent GRETINA developments

- June 2003 Submitted proposal
- Aug. 2003 Received CD0 approval
- Nov. 2003 LBNL Review
- Dec. 2003 DOE Review
- Feb. 2003 Received CD1 approval

GRETINA Cost (Jan. 04)

Item	Cost (M\$)
• Mechanical	0.91
• Detector	6.95
• Electronics	1.52
• Computer	1.15
• Assembly	0.18
• Management	2.22
• Safety	0.12
Sub total	13.05
Contingency	2.85 (22%)
Escalation	1.10
Total (TEC)	17.0

Includes overhead
Does not include R&D
and scientific efforts



Software manpower
(FTE-Year)

	MIE	Redirected
Design	1.93	2.84
Production	2.93	2.07
Total	4.86	4.91

GRETINA Schedule

Critical Decisions

- **CD0 : Mission need** **Aug. 2003**
- **CD1 : Preliminary Baseline Range** **Feb. 2004**
- **CD2A/CD3A : Performance Baseline range for long lead time items** **April 2005**
- **CD2B/CD3B : Start Construction** **Sept. 2007**
- **CD4 : Start of Operation** **May 2010**

Milestones

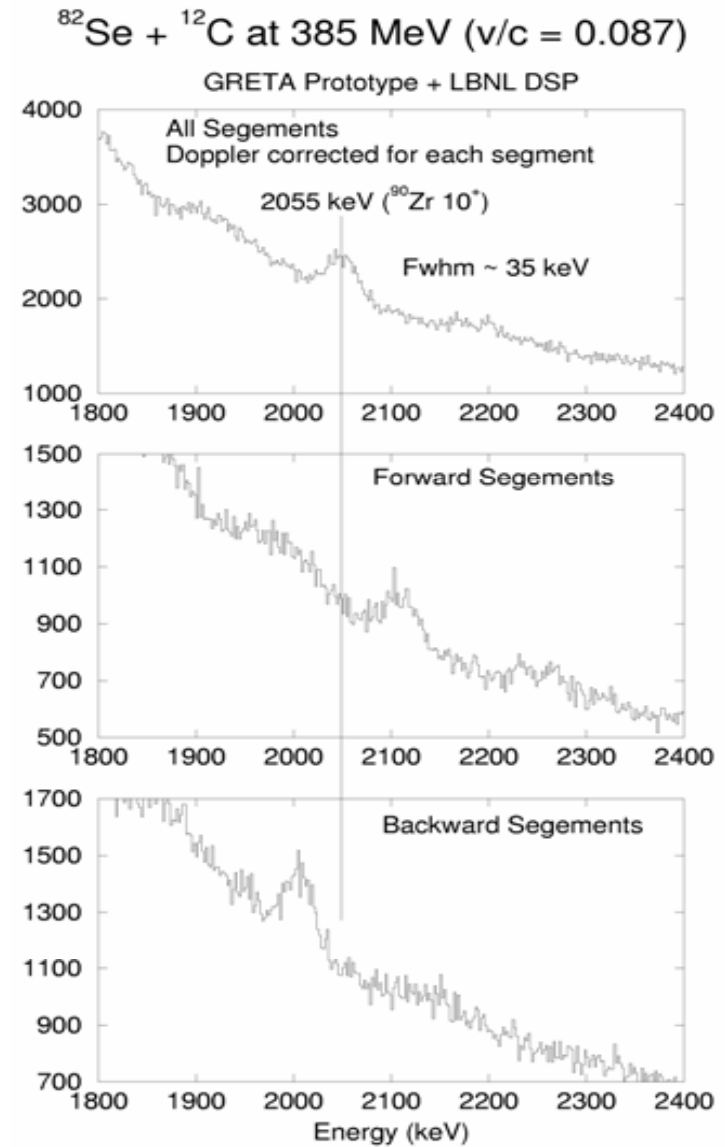
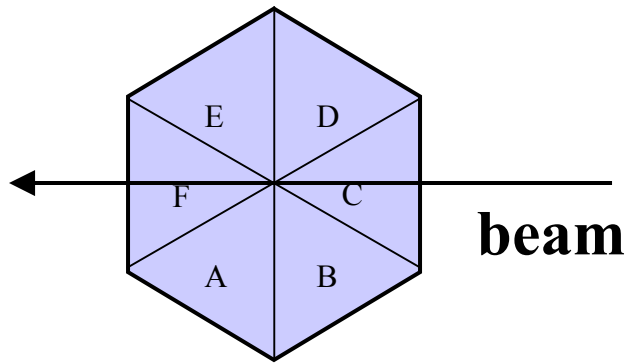
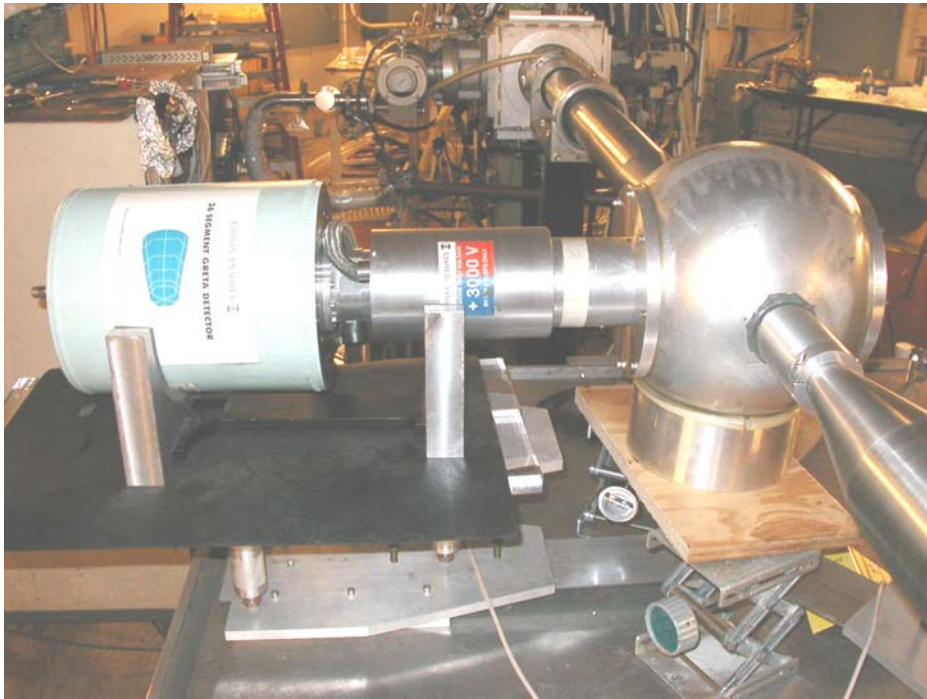
- Complete procedures/apparatus for detector tests **Dec. 2004**
- Finish characterization of 1st detector module **May 2006**
- Complete prototypes of subsystems **June 2007**
- Complete mechanical system production **June 2008**
- Complete production of subsystems **Apr. 2009**

R&D Accomplishments

Prototyping (2001 – 2004)

- **Three-crystal detector module**
 - Ordered 9/6/02, received 6/4/2004
- **End-to-end data analysis**
 - Analyzed both source data and simulated data
 - Measurements agreed with simulation
- **In-beam test**
 - Demonstrated a position resolution of 2.4 mm (rms)
- **Preamplifier**
 - A new design with a second stage is completed
- **Signal digitizer**
 - 20 Mark II 8-channel modules produced and tested
- **Data acquisition**
 - Set up a VME based acquisition system for signal digitizer
 - Developed software for off-line analysis

GRETA Prototype II in-beam test

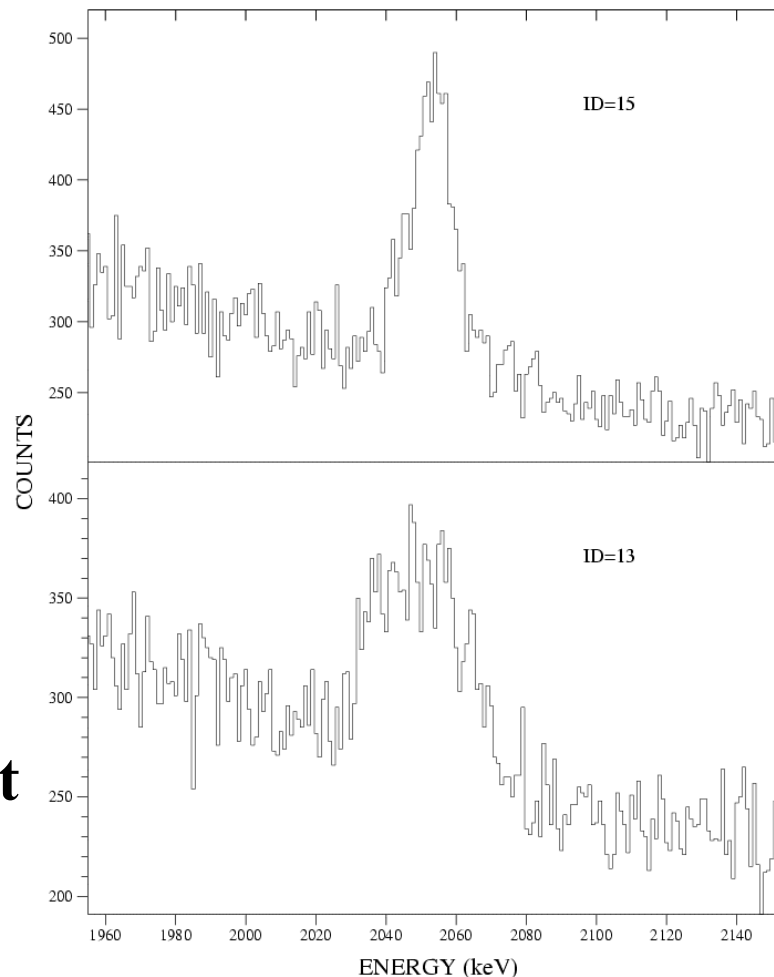


In-beam test Results

Sum all segments in layers 3 and 4, no E

**Doppler
Corrected using
1st hit position
determined by
signal
decomposition**

**Corrected using
center of segment
only**

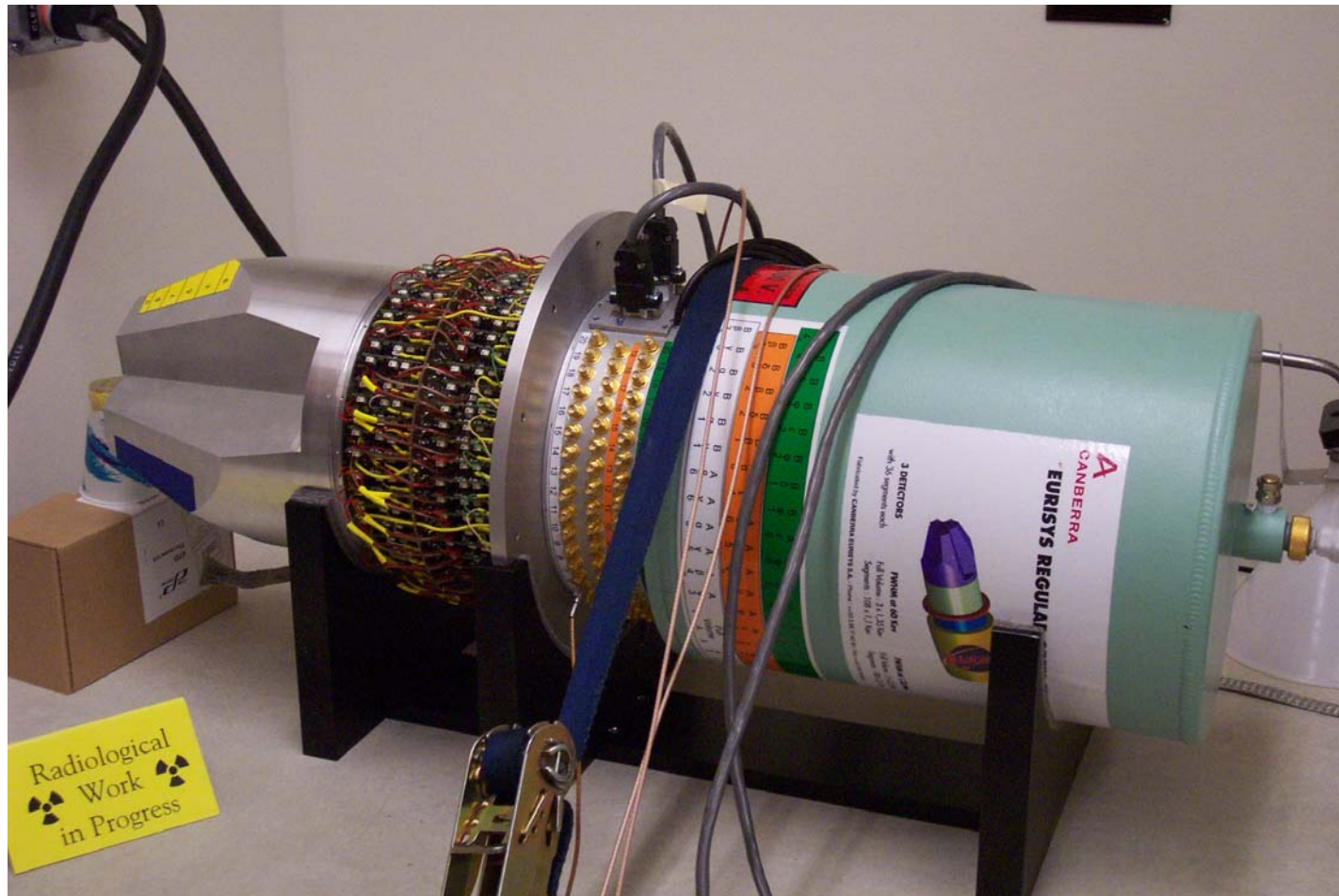


FWHM=14.5 keV
 $\sigma_x = 2.4$ mm (rms)

FWHM=28.3 keV

Three-crystal prototype

Received June 4, 2004



R&D plan in 2004 - 2005

- **Install 120 digitizer channels (15 modules)**
- **Test 3-crystal detector module**
 - Acceptance test
 - Confirm segmentation by surface scan
 - Pulse shape measurements
 - End-to-end test to compare measurements with simulations (source and in-beam)
- **Trigger module developments**
 - Test serial trigger for bit error rate and latency

R&D plan in 2004 – 2005

(Continued)

- **Study detector design : 4 vs. 3 crystal / cryostat, and warm vs. cold FETs**
 - Performance
 - Cost
 - Schedule
 - Maintenance and availability

R&D plan in 2004 – 2005

(Continued)

- **Develop trigger algorithm**
 - For a variety of experimental conditions
- **Develop prototype acquisition system**
 - Digitizer read out computer
 - Network switch
 - 8-node processing farm
 - Implement “proof of principle” software
- **Improve signal decomposition and tracking algorithms**

Collaborating Institutions

Role defined by MOU's
Draft of MOU's received from

- **Argonne National Laboratory**

- Trigger system
- Calibration and online monitoring software



- **Michigan State University**

- Detector testing



- **Oak Ridge National Laboratory**

- Liquid nitrogen supply system
- Data acquisition



- **Washington University**

- Target chamber



Working Groups

- Physics M. A. Riley
- Detector A. O. Macchiavelli
- Electronics D. C. Radford
- Software M. Cromaz
- Auxiliary Detectors D. G. Sarantites

ANL, LANL, LBNL, LLNL, NRL, ORNL
FSU, Georgia Tech, MSU, Purdue, U. Mass. Lowell,
Rochester, Notre Dame, Vanderbilt, Wash. U., Yale

Working group meetings

- Detector
 - March 19-20, ORNL
- Software
 - June 22-23, LBNL
 - Dec. 04, ?
- Electronics
 - July 24-25, ANL