GRETINA Status

GRETINA Detector Working Group Meeting

ORNL, March 19 - 20

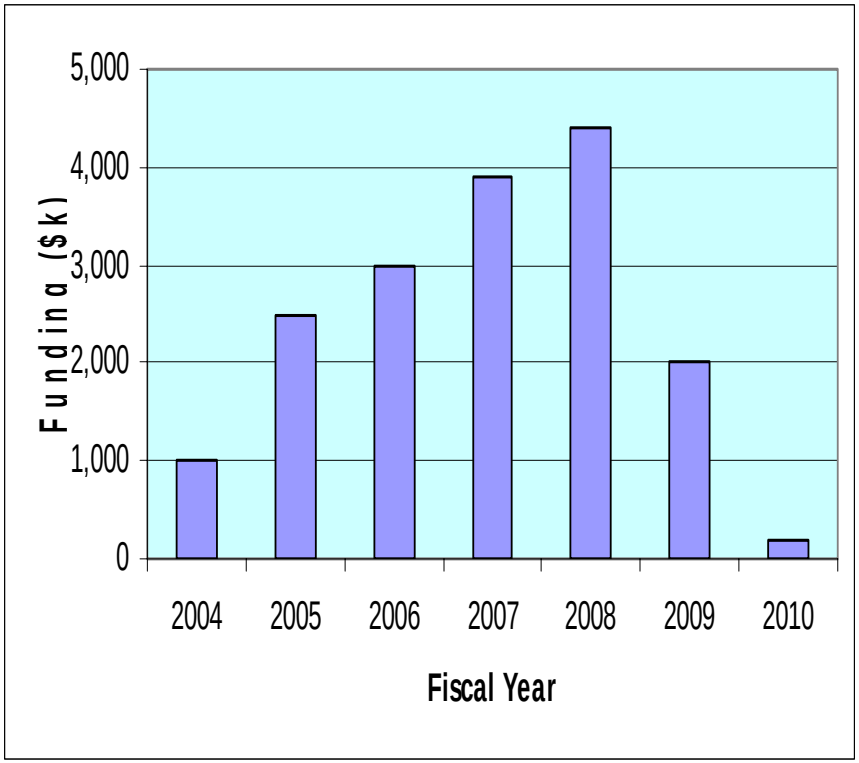
Recent GRETINA developments

- June 2003 Submitted proposal
- Aug. 2003 Received CD0 approval
- Nov. 2003 LBNL Review
- Dec. 2003 DOE Review
- Feb. 2004 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



GRETINA Schedule

Critical Decisions

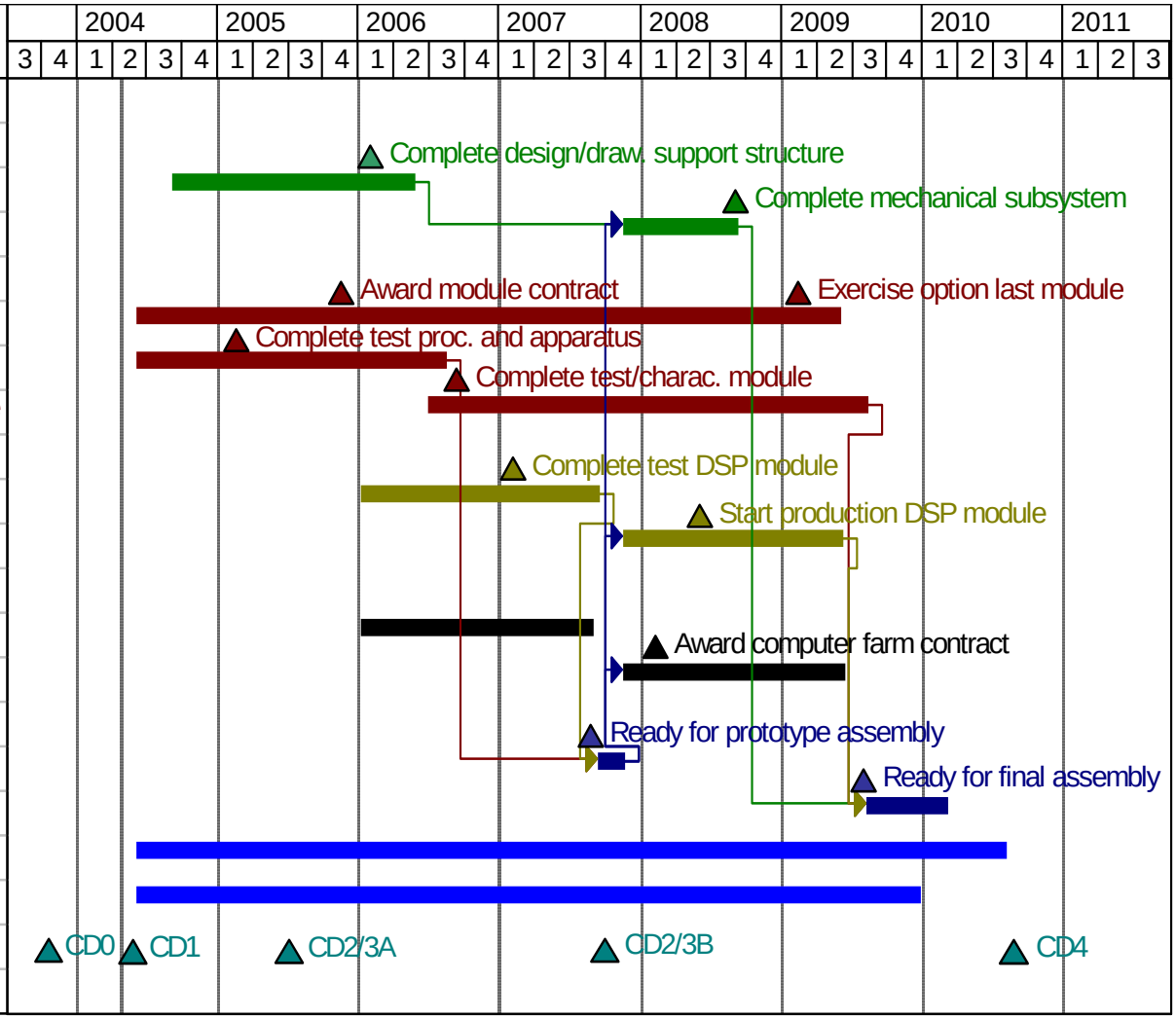
- **CD0 : Mission need** — **Aug. 2003**
- **CD1 : Preliminary Baseline Range** — **Feb. 2004**
- **CD2A/CD3A : Performance Baseline range for long lead time items** — **April 2005**
- **CD2B/CD3B : Start Construction** — **Sept. 2007**
- **CD4 : Start of Operation** — **May 2010**

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

GRETINA Schedule (Fiscal Years)

WBS	Task Name
1	GRETINA
1.1	Mechanical
1.1.2	Design
1.1.3	Production
1.2	Detector Module
1.2.1	Purchasing
1.2.2	Test/Characterize Module 1
1.2.3	Test/Characterize Rest of Module
1.3	Electronics
1.3.2	Prototype
1.3.3	Production
1.4	Computing Systems
1.4.2	Prototype
1.4.3	Production
1.5	System Assembly
1.5.1	Prototype
1.5.2	Production
1.6	Project Management
1.7	Environment and Safety
1.12	Level 1 Milestones: Critical Decisions

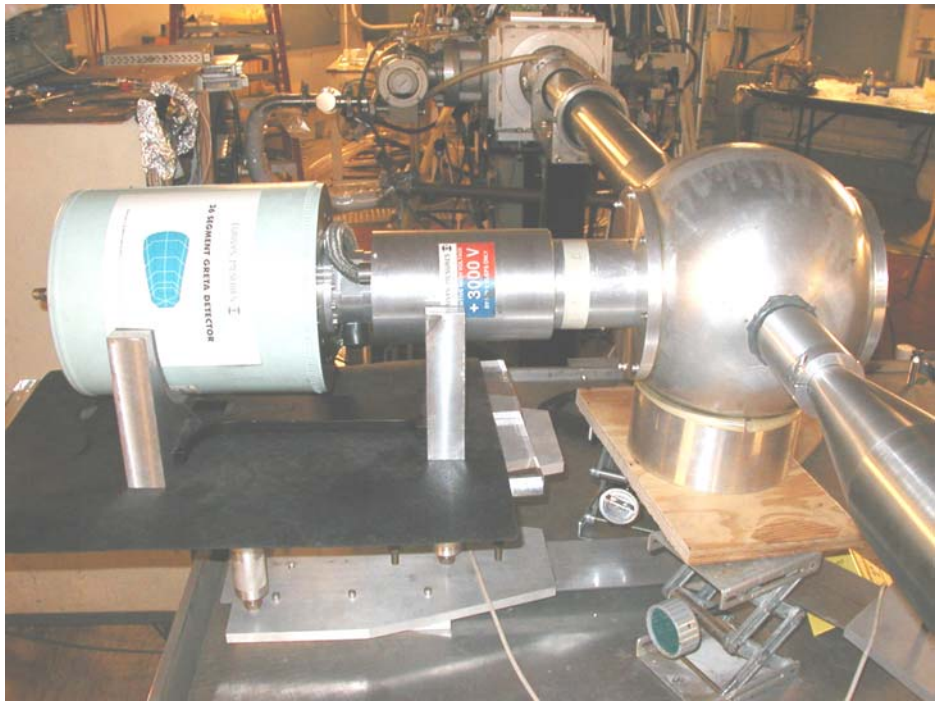


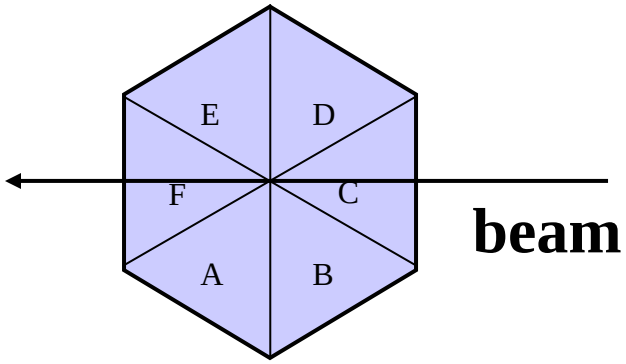
R&D Accomplishments

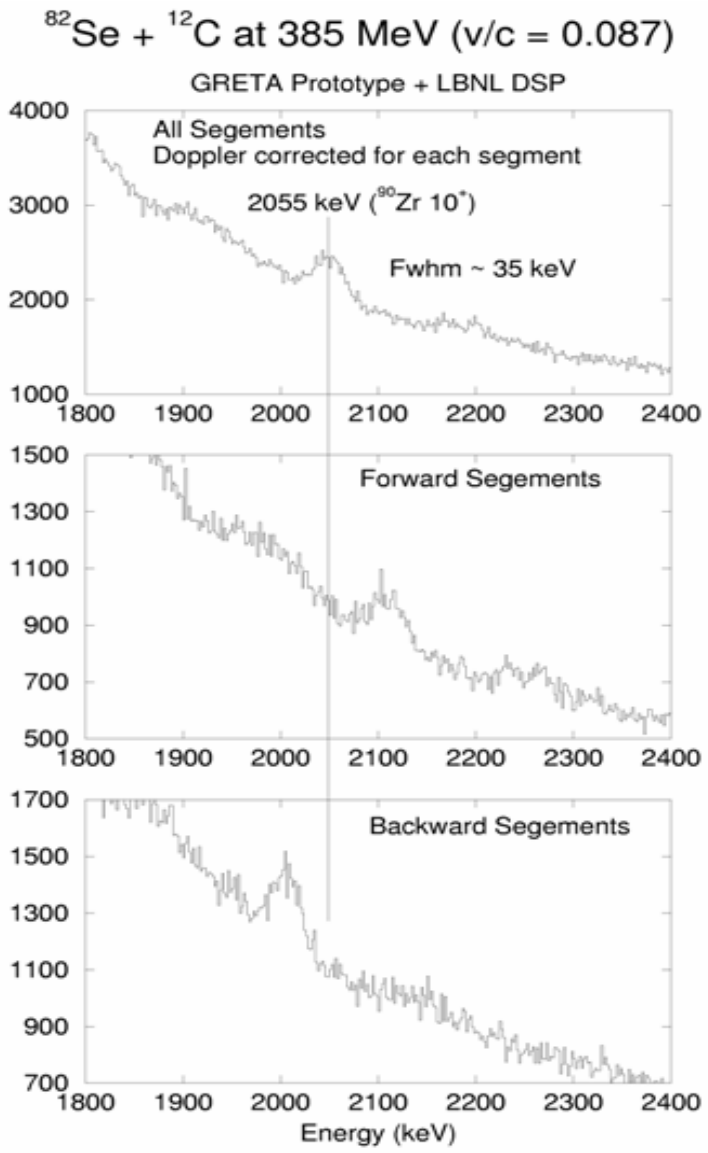
Prototyping (2001 – 2004)

- **Three-crystal detector module**
  - **On order and expecting delivery in early 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 are in production**
- **Data acquisition**
  - **Set up a VME based acquisition system for signal digitizer**
  - **Developed software for off-line analysis,**

GRETA Prototype II in-beam test



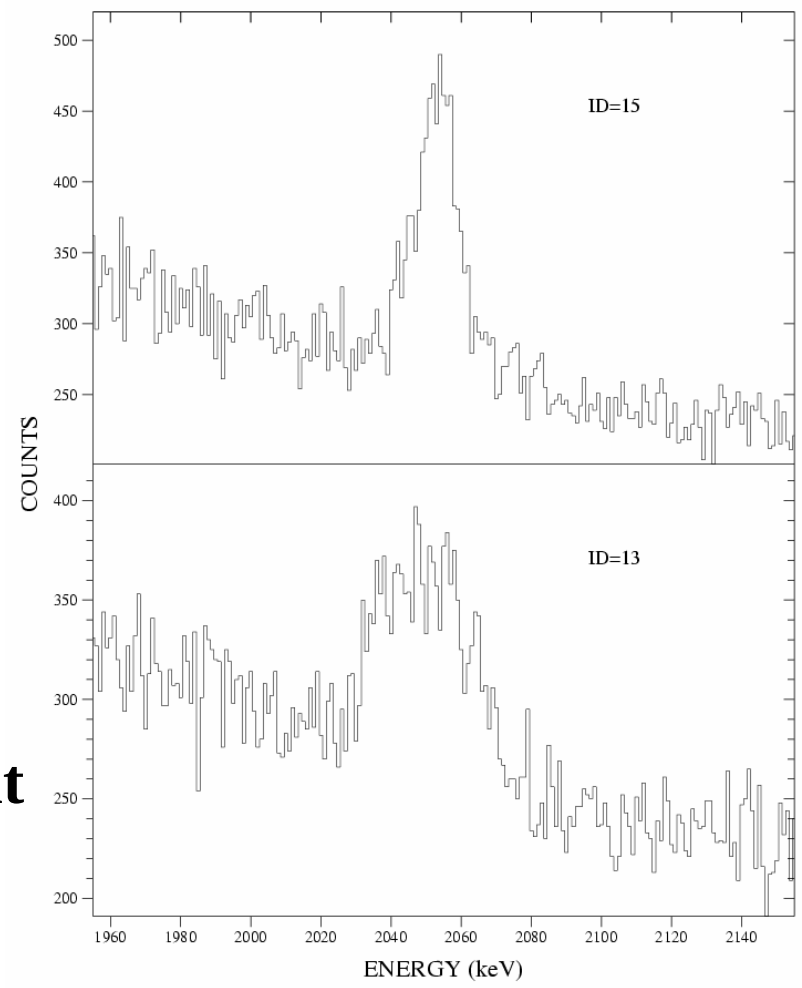




In-beam test Results

Sum all segments in layer 3 and 4, no E

Doppler Corrected using 1st hit position determined by signal decomposition



FWHM=14.5 keV

σ_x = 2.4 mm (rms)

Corrected using center of segment only

FWHM=28.3 keV

R&D plan in 2004 - 2005

- **Install 120 channel (15 module) digitizer**
- **Test 3-crystal detector module**
  - Acceptance test
  - Pulse shape measurements
  - End-to-end test
- **Trigger module developments**
  - Test serial trigger for bit error rate and latency

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
  - Slow control software

- **Michigan State University**
  - Detector testing

MICHIGAN STATE UNIVERSITY

- **Oak Ridge National Laboratory**
  - Liquid nitrogen supply system
  - Data acquisition

OAK RIDGE NATIONAL LABORATORY

- **Washington University**
  - Target chamber

Working Groups

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

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

Future Working group meetings

- Software
  - June 04, LBNL
  - Dec. 04, ?
- Electronics
  - July 04, ANL