



... for a brighter future

Superconducting RF at ANL

November 27, 2007

ANL Group: Mike Kelly, Scott Gerbick, Joel Fuerst, Bill Boettinger (NE), Roger Kellogg (AE)*

FNAL Collaborators: Cristian Boffo, Kerry Ewald, Allan Rowe, Dan Olis*

Speaker: Mike Kelly

**left laboratory in 2007*



U.S. Department
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ANL Activities/Projects in Superconducting RF

Projects/Activities

ILC

ATLAS

AEBL

ERL

Project X

Manpower

ANL SRF Group

M. Kelly
J. Fuerst
S. Gerbick
K. Shepard (1 day/week)

Coming soon to ANL...
M. Kedzie (Dec. 2007)
B. DiGiovine (Jan. 2007)

Coordination
Nb procurement, QA
Mechanical & EM
design
Chemistry
Clean processing &
assembly
Cavity Testing

ANL SRF Facilities

**203 Cold
Test Facility**

**203 Surface
Prep Lab**

SCSPF

SRF Activities and Goals (1)

■ ILC

- 30 Electropolish procedures/year for 2008-09 at ANL
- High-pressure rinsing and clean assembly for 9-cell cavities
- ANL GOAL – full range of expertise required for e-cell technology

■ ERL

- High Q (low rf loss) SC cavities required for ERL
- ANL GOAL FY08 – demonstrate a high-Q 1.3 GHz single-cell cavity at ANL (LDRD w/ A. Nassiri)

■ AEBL

- New 2 Kelvin operation for spoke cavities/Have a proposal to DOE to re-start spoke cavity work
- Complete and install a new full-time 2 Kelvin test cryostat
- Proposal writing for FOA

SRF Activities and Goals (2)

■ ATLAS

- 8-cavity state-of-the-art upgrade cryomodule (J. Fuerst)
- Critical for demonstration of technology required for AEBL

■ Project X

- Committed to do surface preparation for a pair of spoke cavity prototypes
- ANL has proposed to do the triple-spoke cavity linac for Project X

V. History/Partial Schedule for ANL SRF Effort for ILC

SRF.03 SRF Processing System

SRF.03.01 Electropolish Process (EP)

A1020	Electropolish Specification
A1030	Electropolish Engineering Design
A1040	EP Engineering Design Review
A1050	EP Component Procurement
A1060	Interface with US Industry on EP
A1070	EP Fabrication and Assembly

SRF.03.02 Cathode Loading Process

A1290	Cathode Loading Activities
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SRF.03.03 SRF Cavity Transport Process

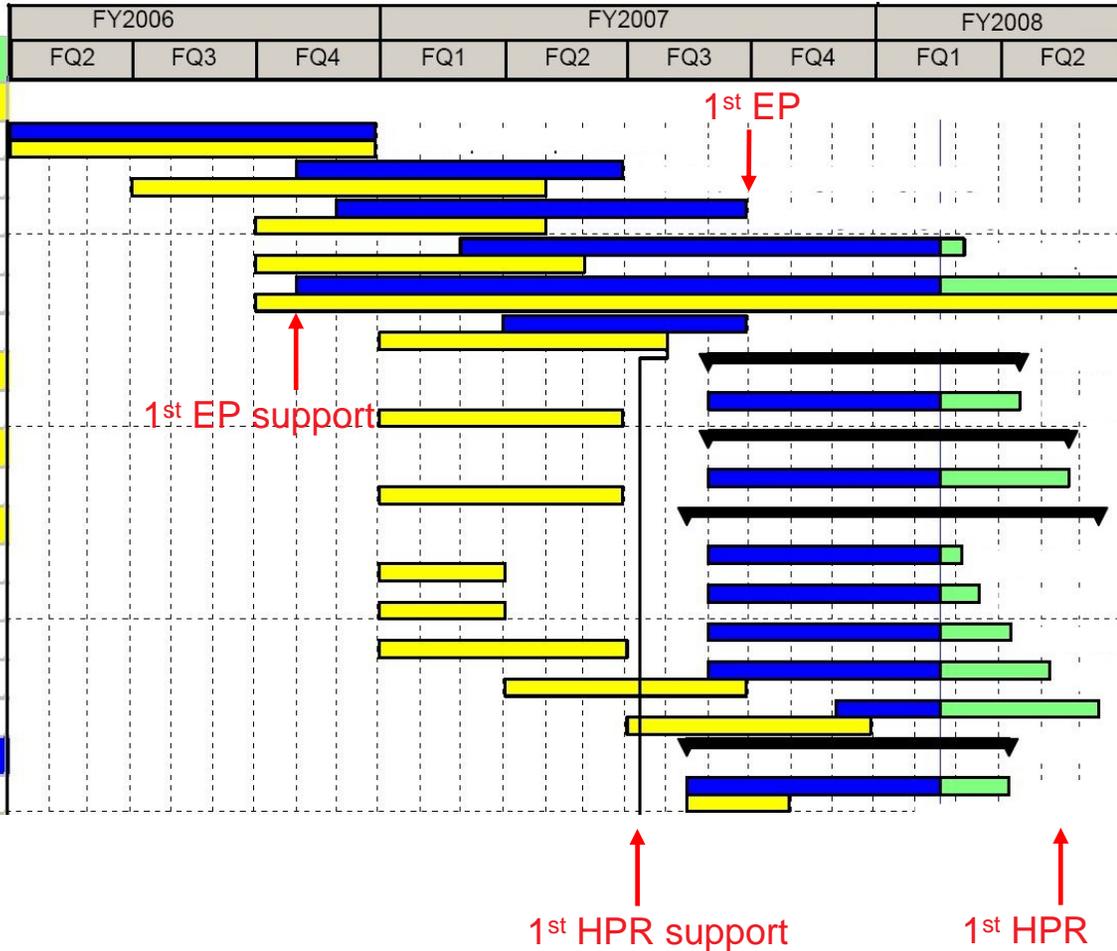
A1300	SRF Cavity Transport Activities
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SRF.03.04 High Pressure Rinse Process (HPR)

A1110	High Pressure Rinse Specification
A1120	HPR Engineering Design
A1130	HPR Design Review
A1140	HPR Component Procurement
A1150	HPR Fabrication and Assembly

SRF.03.04.01 HPR Safety

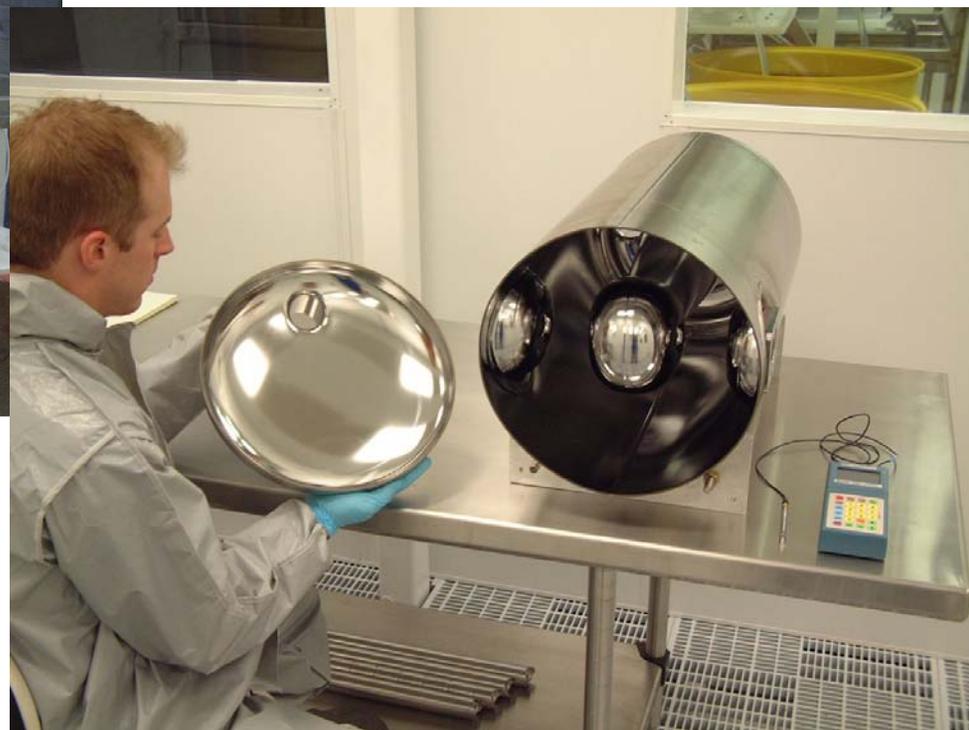
A1155	B101 Fall Arrest System
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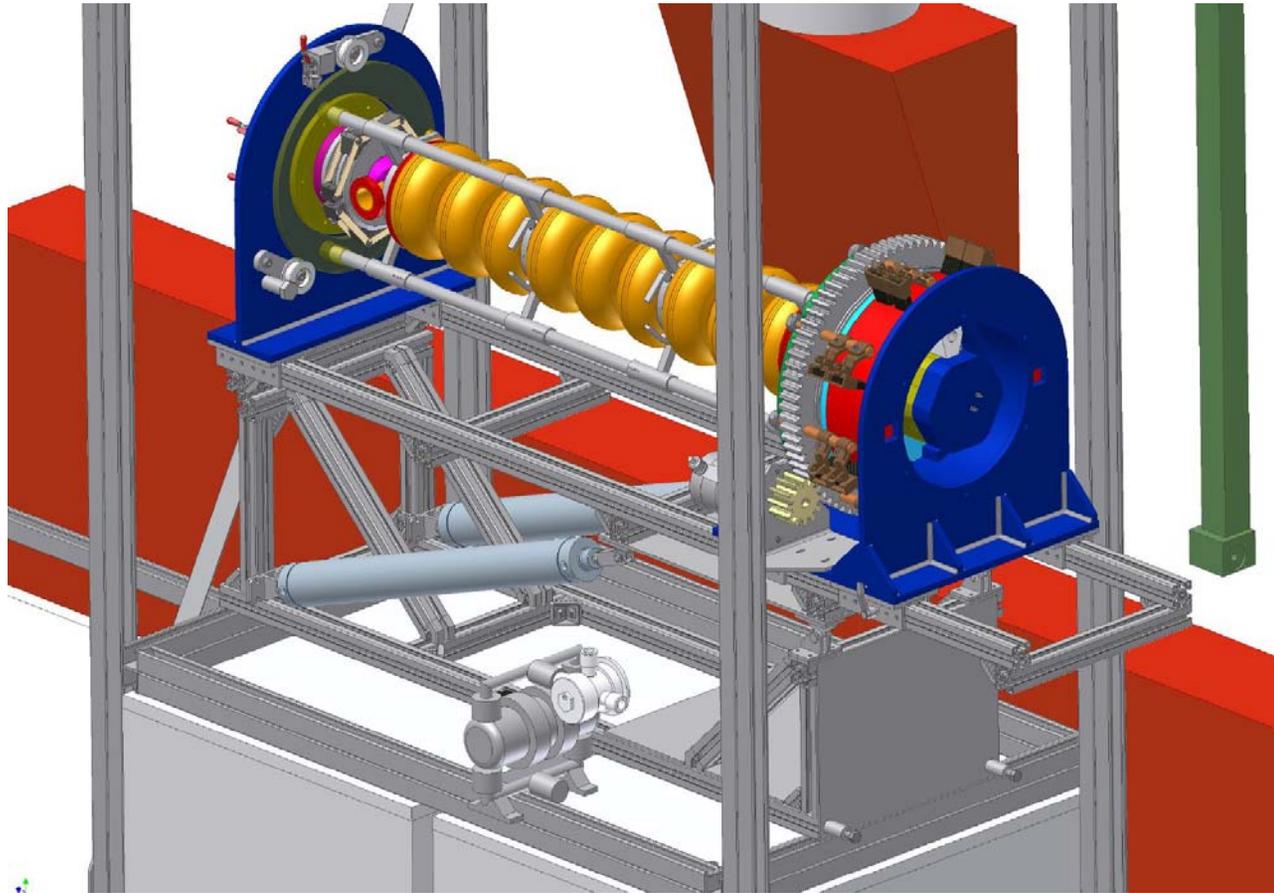
QWR Electropolishing System in ANL Chemistry Room



May 2007, Last of 6 QWR for ATLAS Upgrade

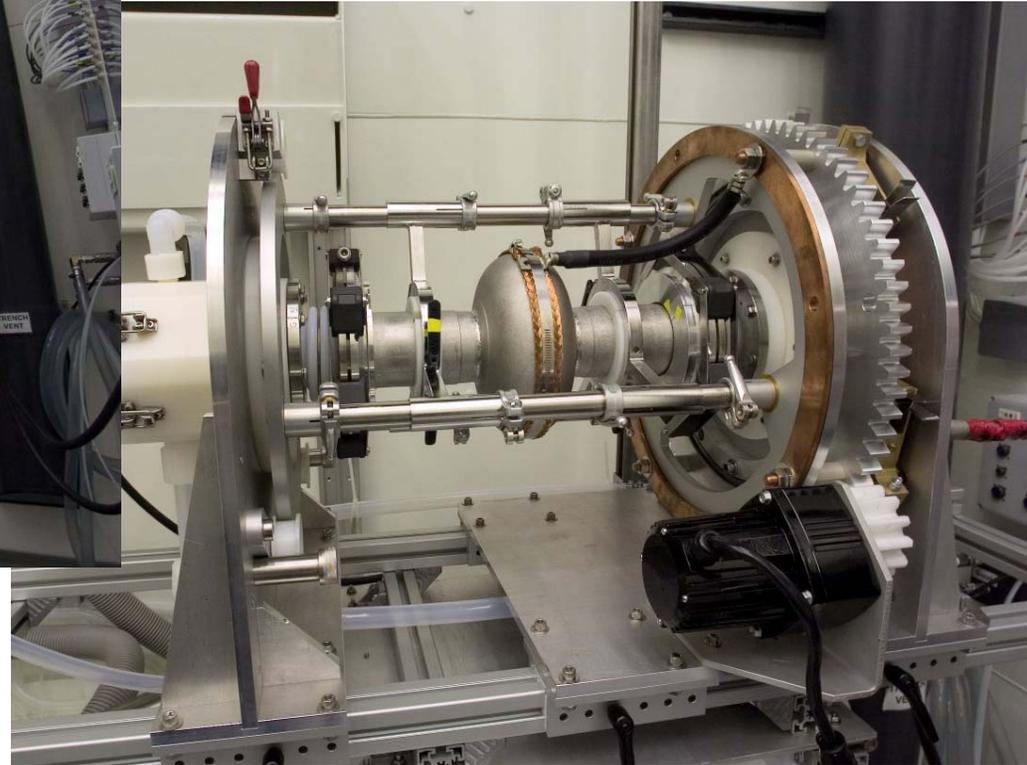


An electropolishing system for 1.3 GHz elliptical cavities



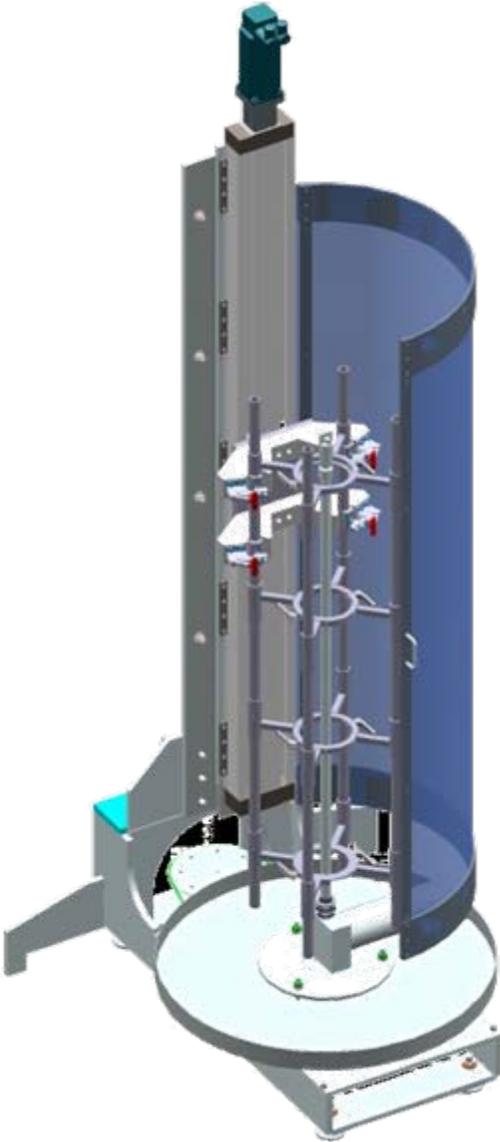
- Initial ANL funding in summer of 2006
- Design and design review w/ international experts fall/winter 2006/07
- Fabrication, assembly and testing spring 2007

An electropolishing system for 1.3 GHz elliptical cavities



- First ILC 1.3 GHz cavity electropolished in August 2007
- Awaiting the delivery on a 9-cell cavity from FNAL, Dec. 2007?
- System is available for max. rate of 1 procedure/week in FY08-09

A high-pressure system at ANL for 1.3 GHz elliptical cavities



- Design 98% complete
- Detail drawings 98% complete
- 75% pcs in hand
- All expected by mid-December

From Dan Olis - FNAL

Status of SRF Activities at ANL

- SRF for ILC is being pursued with high priority
- Electropolishing for ILC was delivered in summer 2007/The EP system is ready and available for 2008-09.
- High-pressure rinsing was funded in July 2007 / Work is progressing OK, system operations in Feb. 2008.

Unsolved problems and challenges...

- Funding for many ANL SRF activities has been unpredictable
- ANL ability to perform small construction projects in a timely fashion is poor
 - (understaffed in FMS?, lack of uniform procedures?)
- Lack of continuity of personnel; too much multitasking
- ATLAS upgrade, AEBL, Project X, (and ERL to a lesser degree) work is being done in our “spare time” and is not receiving and, on the present course, is unlikely to receive the attention these projects deserve

