



# LARP Status & Issues

S. Peggs

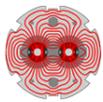
**Synergy with LAUC**

**Finances & last review**

**Accelerator Systems**

**Magnet Systems**

**Program Management**

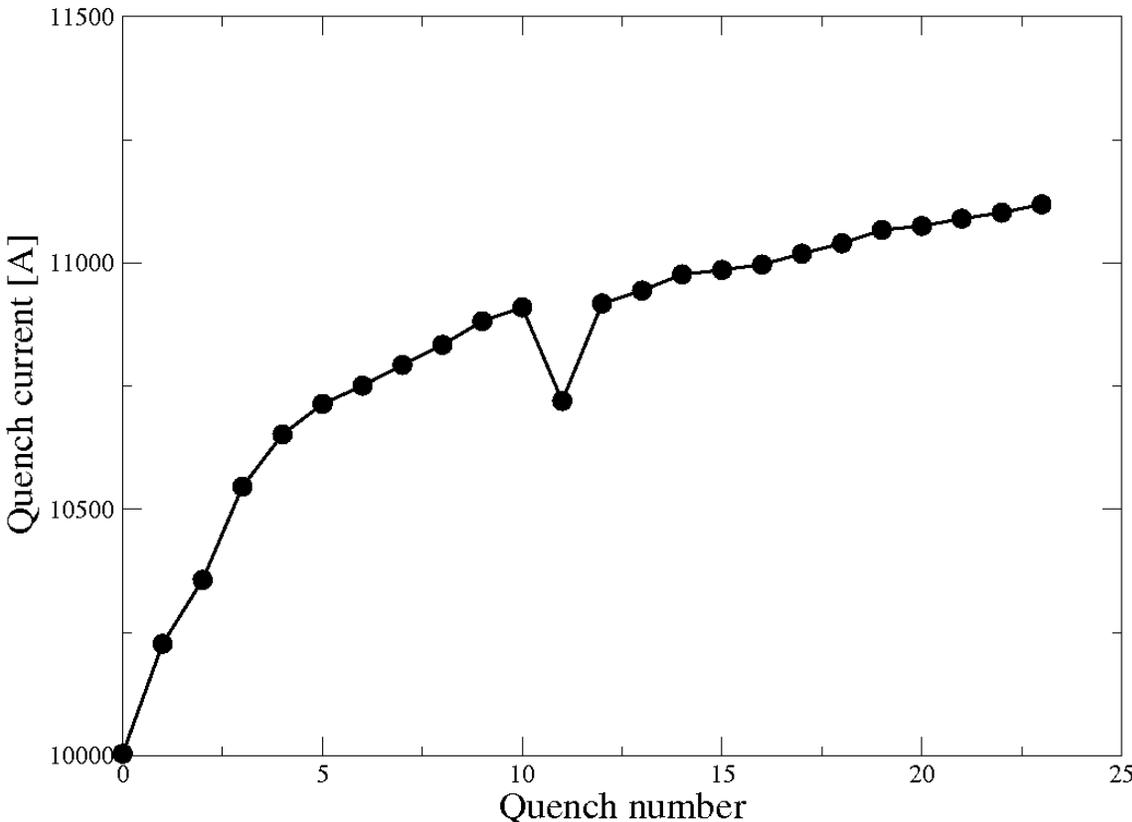


LARP

# Commissioning status (June 16)

<u>Sector</u>	<u>T [K]</u>	<u>Comment</u>
12	25	Cool down ongoing
23	4	Almost cold
34	10	Few problems with cryo plant compressor turbines
45	170	Second cooldown started June 9
56	2	Dipole training campaign stopped at $\sim 6.6$ TeV
67	3	Powering very soon – dipole with turn-to-turn short??
78	2	Powering tests almost complete
81	2	Powering tests started on June 13

LHC arc dipole quenches, sector 56 [Apr 28 - May 29, 08] 7 TeV @ 11,850 A



“One issue is the amount of parallel commissioning ...”

“... everything could be cold in about a month ... but ... suspect it's at least August/September before hardware commissioning is done and beam is anywhere.”



# HEPAP P5

## Report (May 200)

Baltay:

“The LHC is an international project with significant U.S. investment and major U.S. involvement.”

“Significant U.S. participation in the full exploitation of **the LHC has the highest priority** in the U.S. particle physics program.”

“The panel **recommends support** for the U.S. LHC program, including U.S. involvement in the planned detector and **accelerator upgrades, under any of the funding scenarios** considered by the panel.”



# Synergy with LAUC



# LARP R&D Mission Statement

LARP is an R&D Program with 2 mission goals:

- 1) “Make more LHC luminosity, earlier”
- 2) “Use, develop & preserve unique U.S. resources & capabilities in accelerator science & technology.”

LAUC is a Construction Project (Phase-1 only, 2013)

LARP has an implicit 3<sup>rd</sup> goal:

- 3) “Prepare & validate accelerator technologies for Construction Project contributions to LHC upgrades.”

LARP (as always) aims at Nb<sub>3</sub>Sn quads (Phase-2, 2017)



# Milestones

## CERN SLHC-IRP1 Project

Project approval	Dec	2007
Conceptual Design Report	June	2008
<b>Technical Design Report</b>	<b>Summer</b>	<b>2009</b>
Pre-series quadrupole	end	2010
String test		2012
Installation	shutdown	2013

## LAUC

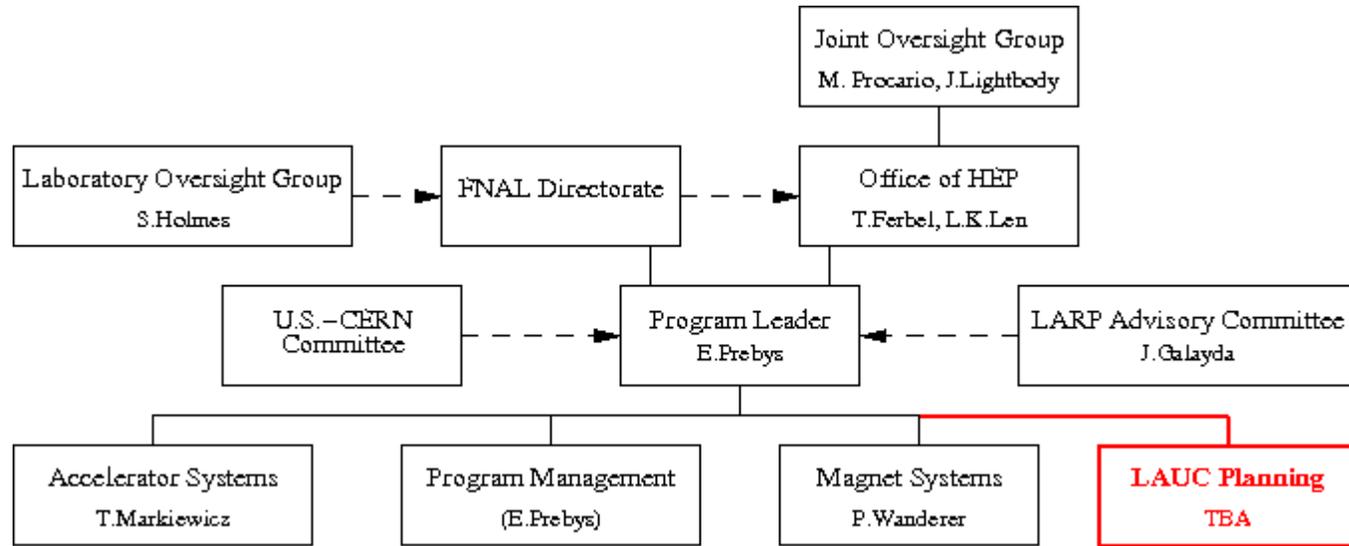
**MUST** match CERN TDR with **CD-2 in summer 2009**

### Actions Authorized by Critical Decision (CD) Approval

CD-0	CD-1	CD-2	CD-3	CD-4
Proceed with Conceptual Design Request PED funding Start monthly PARS & Quarterly Project Performance reporting	<ul style="list-style-type: none"> <li>Allow Expenditure of PED Funds for preliminary design</li> <li>Approval of long-lead procurement if necessary</li> </ul>	<ul style="list-style-type: none"> <li>Establish Performance Baseline</li> <li>Continue design</li> <li>Request construction funding</li> </ul>	<ul style="list-style-type: none"> <li>Approve expenditure of funds for construction</li> </ul>	<ul style="list-style-type: none"> <li>Allow start of operations or project completion</li> </ul>

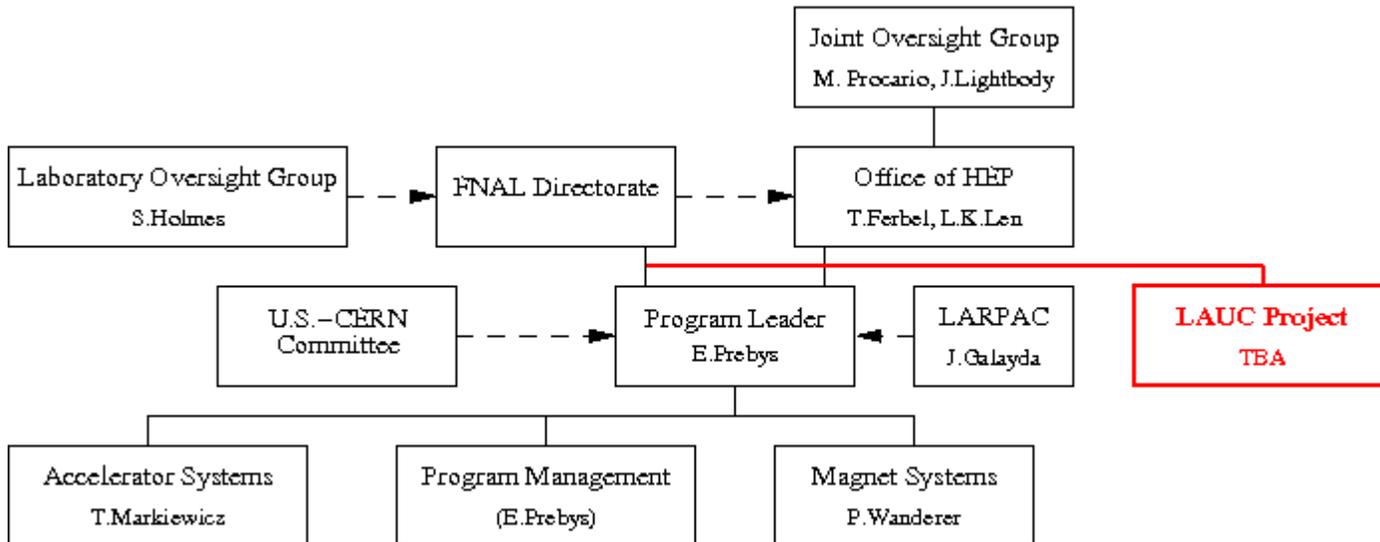


# Co-organization (synergy) with LARP



**FY09:**

“LAUC Planning”  
in parallel to Acc  
Sys, Mag Sys &  
Prog Mgmt.



**FY10-13:**

LAUC on a par  
with LARP.

Different sub-  
structure, shared  
superstructure



## R&D

Current LAUC proposal excludes exciting long term R&D topics that show great potential for “Phase-2”.

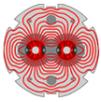
EG: Nb<sub>3</sub>Sn quads, electron lenses, crab cavities, SPS ecloud feedback, ....

Piecemeal spin-offs from LARP to “LAUC” could occur in the future, asynchronous with the 2 IR upgrades.

While LARP and LAUC would be funded separately, nonetheless their strategic planning would be linked.



# Finances & last review



LARP

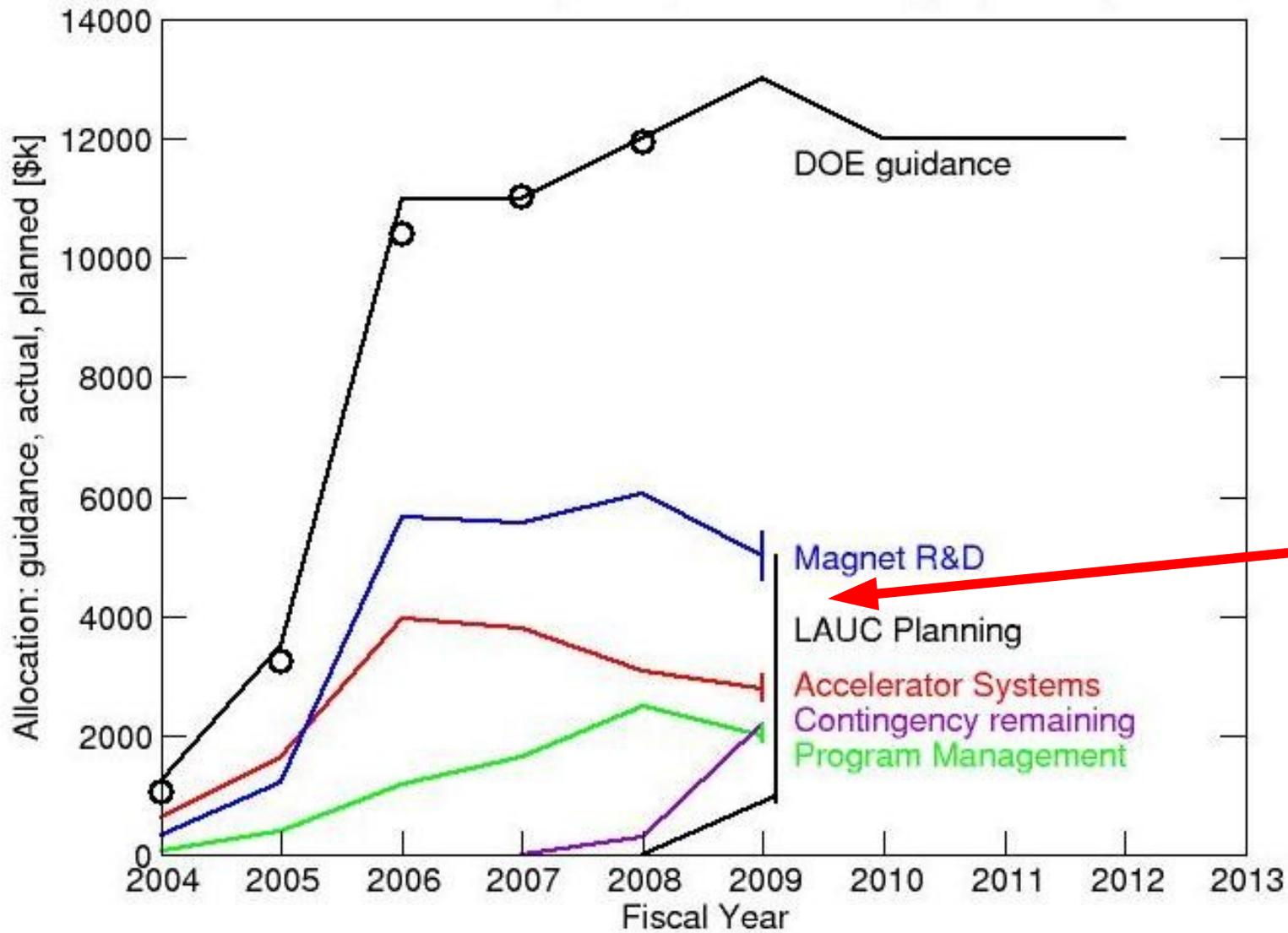
# 3 Scenarios - 12, 13 & 18 M\$

	05/30/07	05/16/08			
	FY07_v2b	FY08_v2d	FY09_12	FY09_13	FY09_18
<b>Grand TOTAL</b>	11000	11918	<b>12000</b>	<b>13000</b>	<b>18000</b>
<b>Acc Systems TOTAL</b>	3811	3063	<b>2600</b>	<b>2800</b>	<b>3000</b>
Instrumentation	1646	1043			
Commissioning	560				
Collimation	950	1100			
Acc Physics	655	920			
<b>Magnet Sys TOTAL</b>	5563	6039	<b>4600</b>	<b>5000</b>	<b>5400</b>
Design Studies	493				
Model Quads	2275	1027			
Supporting R&D	1421				
Long Quads		4009			
Materials	1374	1003			
<b>Prog Mgmt TOTAL</b>	1626	2502	<b>1900</b>	<b>2000</b>	<b>2200</b>
Administration	1626	1922			
Commissioning		240			
Joint IR Studies		340			
<b>LAUC Planning</b>			<b>900</b>	<b>1000</b>	<b>5000</b>
<b>Contingency TOTAL</b>	0	314	<b>2000</b>	<b>2200</b>	<b>2400</b>

LARP  
must  
pay for  
CD-2 !!



# The past, FY09 & DOE guidance



DOE guidance has been accurate (thank you)

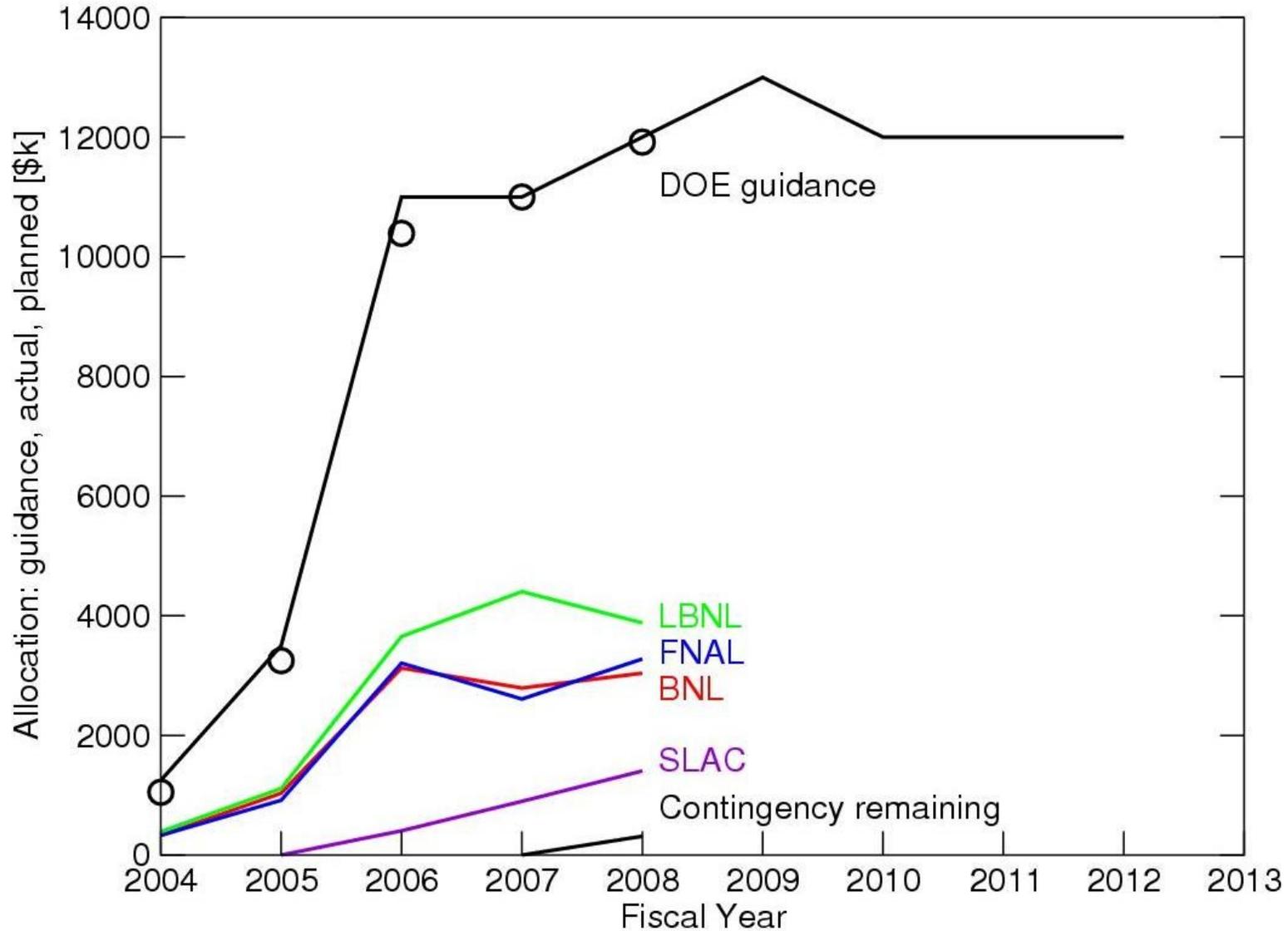
“Error bars” show range of 12, 13 & 18 M\$ scenarios

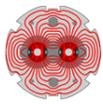
(Contingency “only” shows in FY09)



# The past, by lab

“No entitlements.”





# Integrated expenditures

June 9, 2008		Total						
WBS	Fiscal Year	2004	2005	2006	2007	2008	2009	TOTAL
	DOE Guidance	1250	3500	11000	11000	12000	13000	87750
	Actual	1050	3250	11000	11000	11918		38218
<b>1</b>	<b>Accelerator Systems</b>	<b>637</b>	<b>1646</b>	<b>3684</b>	<b>3811</b>	<b>3063</b>		<b>12841</b>
1.1	<b>Instrumentation</b>	300	590	1635	1646	1043		5214
1.1.1.1	Tune & chrom. feedback	138	195	430	310	100		1173
1.1.1.2	Luminometer	162	395	960	1134	868		3519
1.1.1.4	Schottky monitor			245	122	15		382
1.1.1.5	AC dipole				80	60		140
1.2	<b>Commissioning (also see 3.2)</b>	110	326	879	560			1875
1.3	<b>Collimation</b>		320	500	950	1100		2870
1.4	<b>Accelerator Physics</b>	227	410	670	655	920		2882
<b>2</b>	<b>Magnet Systems</b>	<b>325</b>	<b>1213</b>	<b>5817</b>	<b>5563</b>	<b>6039</b>		<b>18957</b>
2.1	<b>Design Studies</b>		10	416	493			919
2.2	<b>Model Magnets / HQ</b>		798	2397	2275	1027		6497
2.3	<b>Supporting R&amp;D / LQ</b>		316	1982	1421	4009		7728
2.4	<b>Materials</b>		89	1022	1374	1003		3488
<b>3</b>	<b>Program Management</b>	<b>88</b>	<b>391</b>	<b>1499</b>	<b>1626</b>	<b>2502</b>		<b>6106</b>
3.1	<b>Administration</b>	88	391	1499	1626	1922		5526
3.2	<b>Commissioning (also see 1.2)</b>					240		240
3.3	<b>Joint IR Studies</b>					340		340
<b>4</b>	<b>Contingency</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>314</b>		<b>314</b>

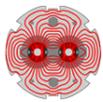


# Closeout statement for mini-review of LARP

on Dec 5, 2007

1) We thank LARP management for their excellent presentation of the status of the program, for providing options for future direction of LHC accelerator activities, for the frank and open discussion of management issues, and the **increased need for prioritization of tasks, as some aspects of the R&D take on more of the character of deliverable projects.**

2) **Excellent progress continues on LARP accelerator systems and Nb<sub>3</sub>Sn magnet development.** Nevertheless, judging from the Nov 28-29, 2007 review of LQ magnet structure, **important issues** pertaining to quench performance and stress still **remain to be fully resolved.**



## Closeout statement – 2

3) Contributing to an upgrade of LHC luminosity through U.S. provision of rotatable collimators and Nb<sub>3</sub>Sn quadrupole magnets for intersection regions appears to be an excellent thrust that will be well matched to U.S. expertise and will improve overall LHC performance. As with all projects of this magnitude, this step requires a full specification of goals, and we urge the development of realistic deliverables and schedules, recognizing that no project funds can be expected before **FY10**, and that any initial expenditures for R&D will have to be covered through the existing LARP budget.

4) The U.S. activities proposed for the Phase-I upgrade must be well defined and coordinated with CERN to avoid future misunderstandings. Decisions pertaining to scope, schedule and implementation of U.S. deliverables should be agreed upon jointly between the U.S. and CERN, and not decided by CERN alone. (The degree of mutual understanding in Phase-I is certain to affect any U.S. contributions to possible subsequent upgrades of the LHC.)



# Accelerator Systems



# FY08 budget – Acc Sys

## LARP FY08 budget version v2d. Final.

		May 16, 2008		Total	Labor+MTSC			
WBS			[\$k]	BNL	FNAL	LBNL	SLAC	
US LHC Accelerator Research Program				<b>11,918</b>	<b>3,040</b>	<b>3,277</b>	<b>3,882</b>	<b>1,405</b>
1	<b>Accelerator Systems</b>	<b>Markiewicz</b>	<b>3,063</b>	<b>380</b>	<b>490</b>	<b>1,068</b>	<b>1,125</b>	
1.1	<b>Instrumentation</b>	<b>Ratti</b>	<b>1,043</b>	<b>115</b>	<b>60</b>	<b>868</b>	<b>0</b>	
1.1.1	Phase I							
1.1.1.1	Chromaticity feedback	Cameron	100	75	25			
1.1.1.2	Luminometer	Ratti	868			868		
1.1.1.4	Schottky monitor	Jansson	15		15			
1.1.1.5	AC dipole	Kopp	60	40	20			
1.3	<b>Collimation</b>	<b>Markiewicz</b>	<b>1,100</b>	<b>50</b>	<b>100</b>	<b>0</b>	<b>950</b>	
1.3.2	Phase II							
1.3.2.1	Rotatable Collimators	Markiewicz	950				950	
1.3.2.4	Crystal collimation	Mokhov	150	50	100			
1.4	<b>Accelerator Physics</b>	<b>Fischer</b>	<b>920</b>	<b>215</b>	<b>330</b>	<b>200</b>	<b>175</b>	
1.4.1	Studies							
1.4.1.1	Electron cloud	Furman	235	75		160		
1.4.1.2	Beam-beam simulation	Sen	200		120	40	40	
1.4.1.3	Wire Beam-Beam comp.	Fischer	50	50				
1.4.1.4	New initiative studies	Markiewicz	245	20	130		95	
1.4.1.5	Electrons lens	Shiltsev	165	45	80		40	
1.4.1.6	Crab cavities	Calaga	25	25				
2	<b>Magnet Systems</b>	<b>Wanderer</b>	<b>6,039</b>	<b>1,583</b>	<b>2,138</b>	<b>2,318</b>		
3	<b>Program Management</b>	<b>Peggs</b>	<b>2,502</b>	<b>1,077</b>	<b>649</b>	<b>496</b>	<b>280</b>	
4	<b>Contingency</b>		<b>314</b>					
	Accelerator Systems		0					
	Magnet R&D		314					
	Program Management		0					



# Luminosity monitors

## *MEMORANDUM*

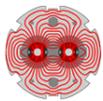
From: Enrico Bravin CERN  
To: Alessandro Ratti LBNL/LARP, Tom Markiewicz LARP, Steve Peggs LARP, Oliver Bruning CERN/LARP  
Cc: Roland Garoby CERN, Daniela Macina CERN  
Subject: Decision concerning the LHC luminosity monitor based on the fast ionization chambers developed by Lawrence Berkeley National Laboratory  
Date: 2 June 2008

CERN will go to a PMT system of lumi monitoring for 2008, reverting to the nominal LARP/LBNL ionization chamber system only in 2009:

"[LARP/]LBNL should use this opportunity to focus on the development of the BRAN-A system for the 2009 startup"

"It is important to underline that CERN is counting on the [LARP/]LBNL ionization chambers ... from day one of the run in 2009."

"... no more delays can be tolerated ...."



## Response

June 16 memo from Ratti+Markiewicz+Peggs

“We expect to have **all the remaining hardware** ... required to complete the BRAN-A system at CERN by the **end of July 2008**, ready for installation in IP1 and IP5, as desired by CERN.”

“... **installation in IP1 and IP5** can proceed according to the availability of the machine and its service areas in **August.**”

“While some uncertainties for the July delivery still exist, there is absolutely **no doubt that the system will be completely ready for the 2009 LHC run.**”

“... we plan to operate a full BRAN-A system in the SPS North Area during the run scheduled to start on **June 30, 2008** ...”

“... regularly scheduled trans-atlantic communications ...”

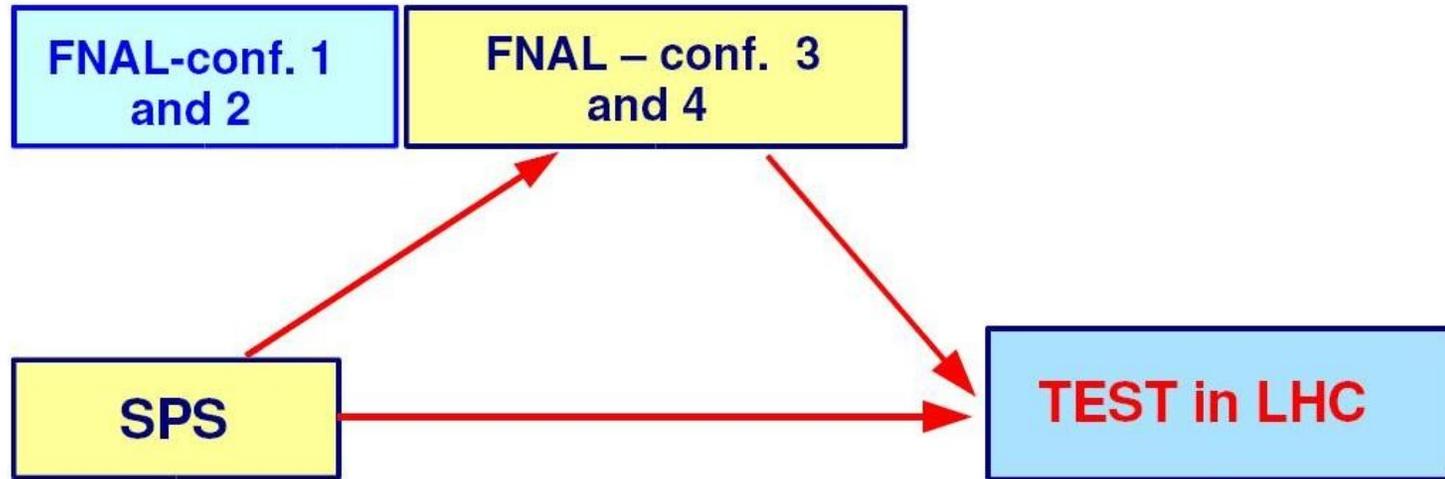
“LARP management will enhance its monitoring of this crucial Accelerator Systems task through regular meetings of ASAC ...”

“We look forward to continued collaboration and to the successful beam commissioning of the BRAN-A system in 2008.”

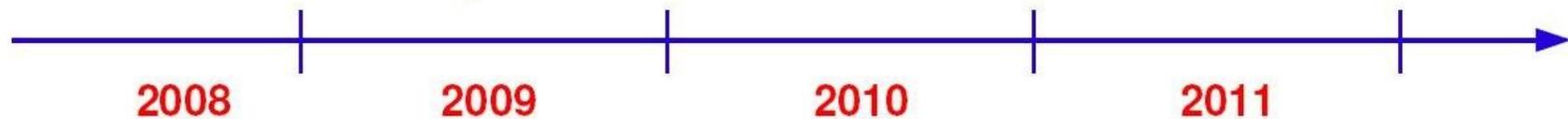


# Crystal collimation experiments CRYSTAL & T980

**04/2008: FNAL → MoU phase + Conf. 1**

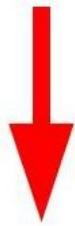
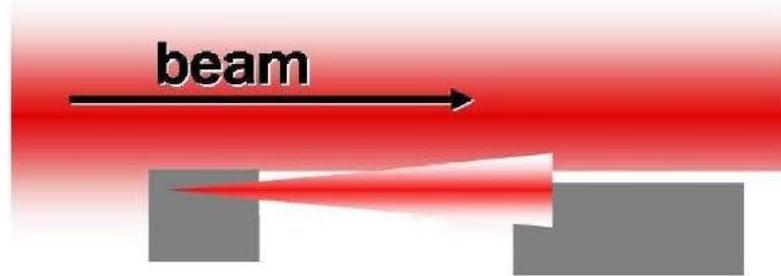


**01/2008: SPS → experiment**

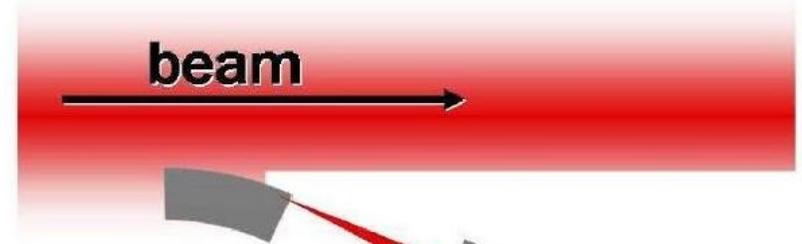


**Fermilab AAC:** "... [T980 is a] unique opportunity ... to build a case for an LHC implementation of a **collimation scheme that incorporates crystals** as a key component."

## A better primary collimator?



***The halo is scattered over the whole angular range***

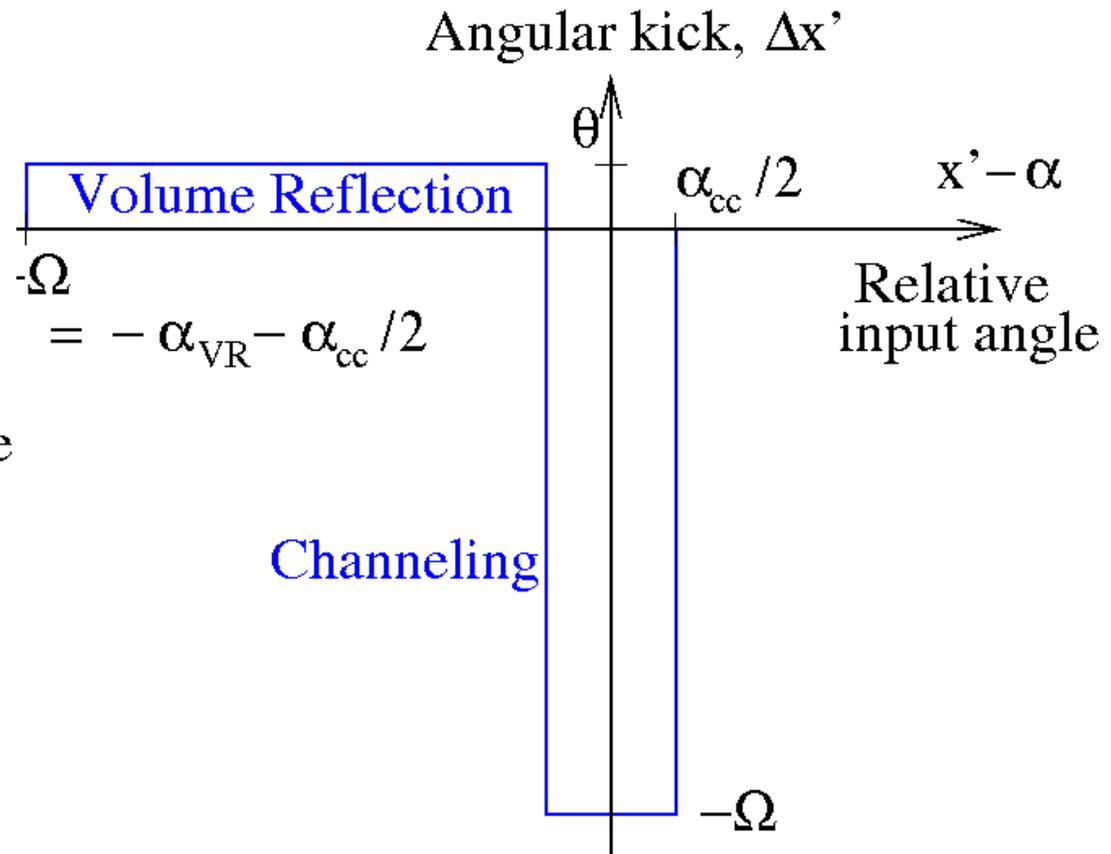
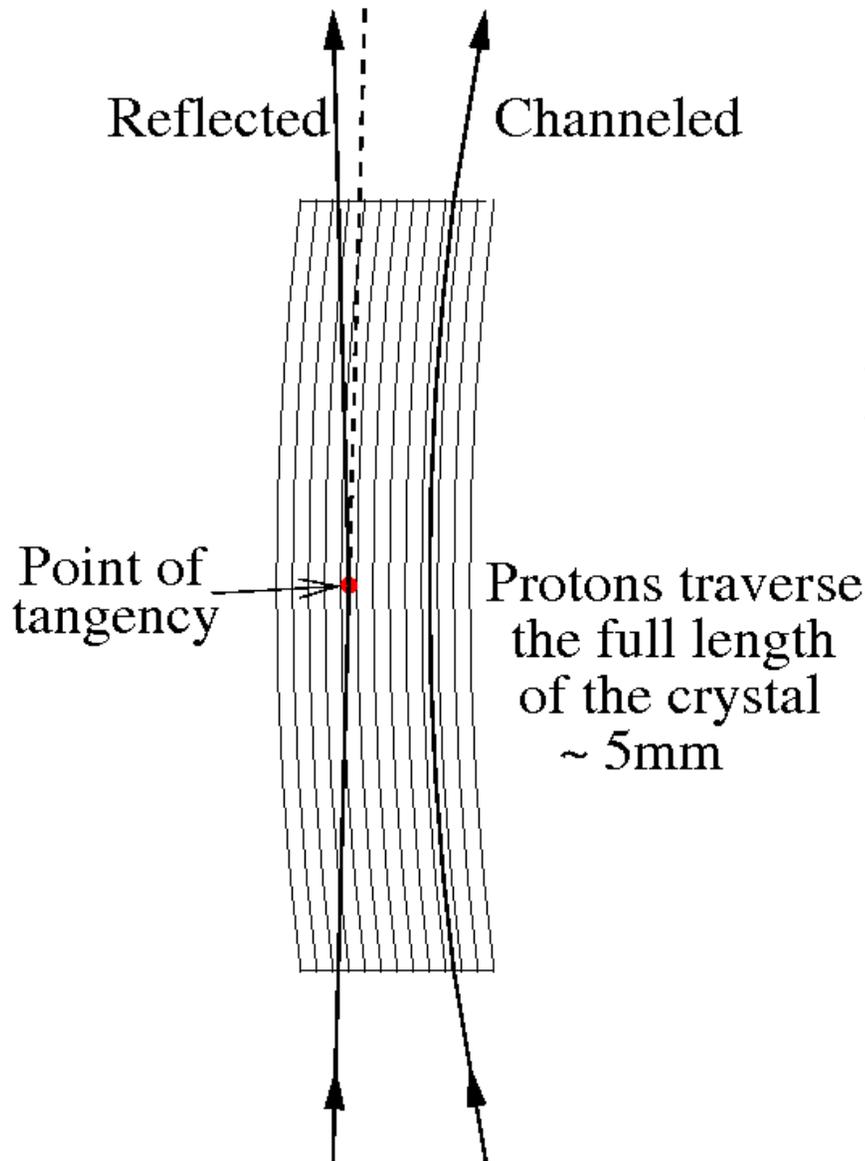


***The halo is steered in a precise direction***



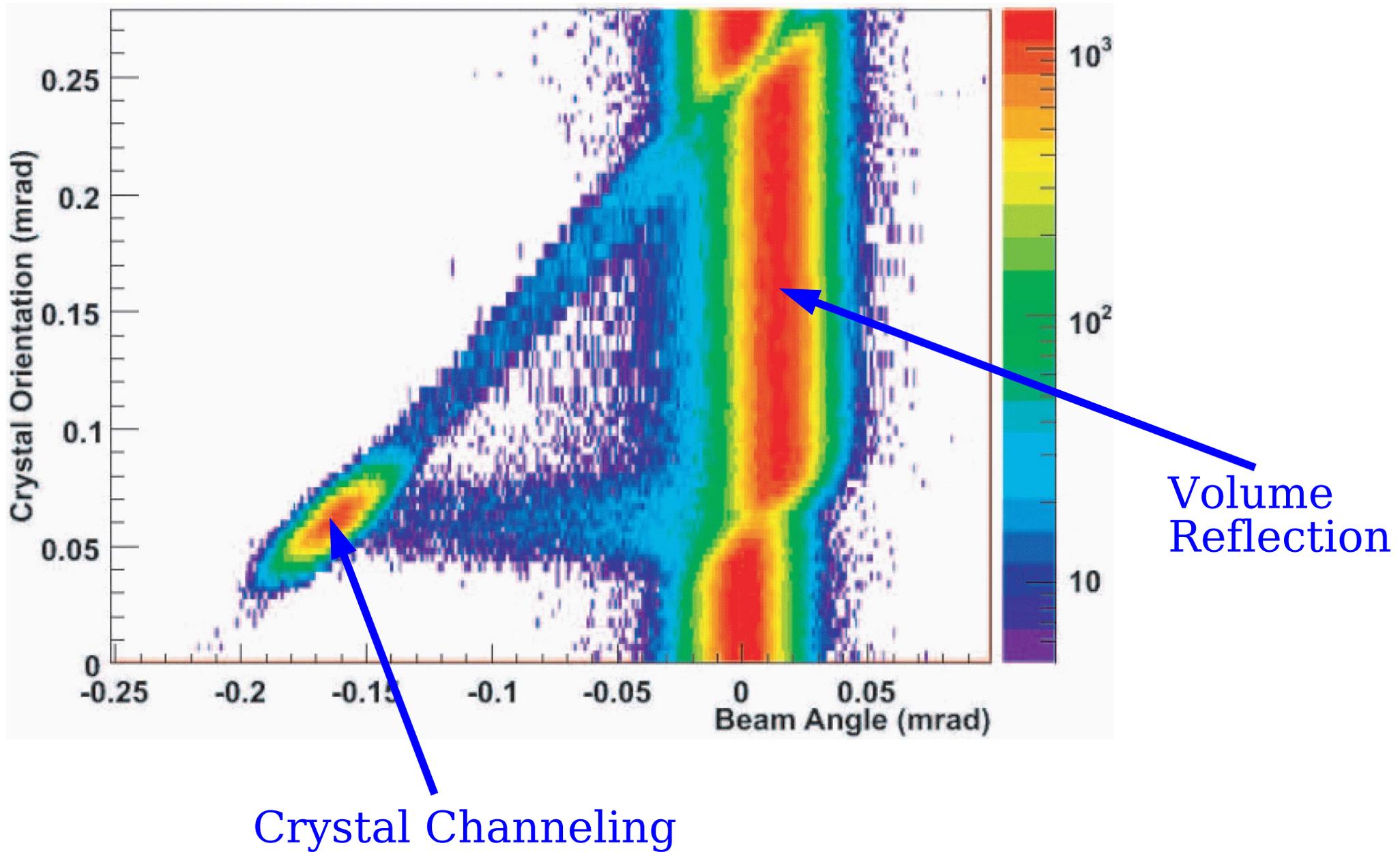
“... revolutionize collimation systems in ... LHC & ... future accs.”

# Simple model



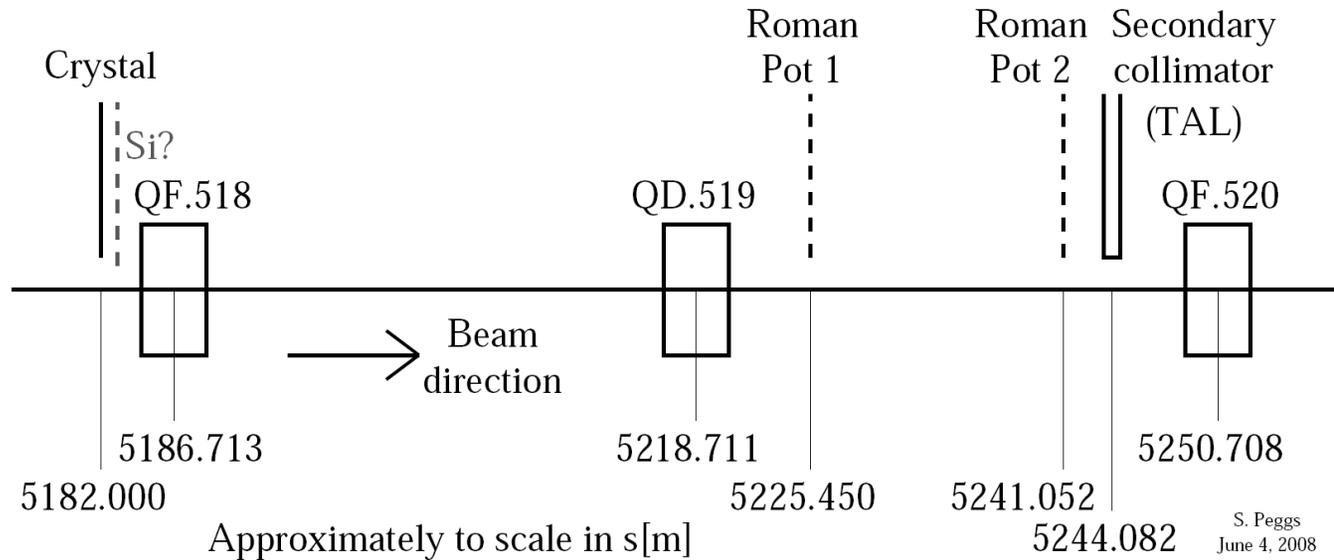
Newly understood **Volume Reflection** has great significance ???

# In a beam line (SPS 2006 & 2007)



# In a circular machine (SPS & Tevatron)

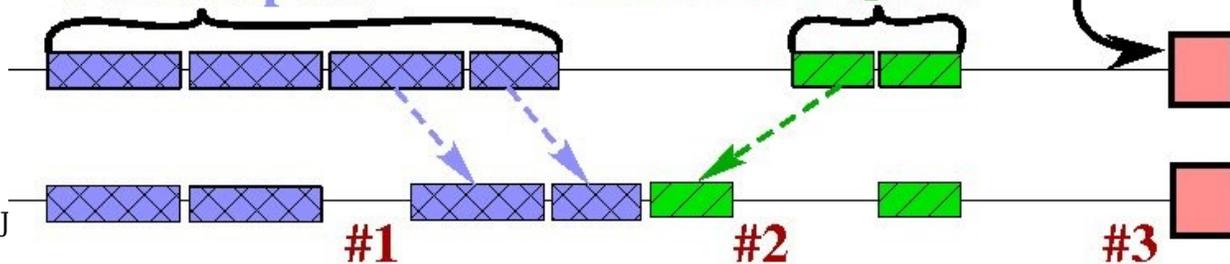
## CRYSTAL experiment layout



Warm Dipoles

Warm C-Magnets

Cold Quad





## Electron Lenses (for Phase-2?)

Two lenses are **currently in operation** in the Tevatron, although they are **not in routine use** as beam-beam compensation devices.

A **prototype** could be installed in RHIC to validate **their technical effectiveness** as compensation devices.

The broadest possible LAUC scope would be to use electron lenses in LHC for compensation of both

- head-on and
- long-range beam-beam, as well as for
- halo-cleaning or collimation (speculative).



# Crab Cavities

CERN (Evans) is enthusiastic. They suggest adding LQR drops for SRF during 2013 IR rebuild.

There is a lot of [international interest](#) in this activity, including [CARE](#) (Daresbury) and [Japan](#) (KEK). [Eg “CC08” meeting Feb 25 & 26 at BNL.]

Kick-off SBIR was rejected by DOE-NP – setback.

Needs a strategic goal, eg [install a single prototype cavity for validation during Phase-1 installation in 2013?](#)

Intermediate goal would be to establish CERN buy-in to prototype CC installation. Workshop/review at CERN in December 2009?



# AS Task Proposals

New proposals for FY09 funding at CM10:

LLRF studies at LHC, SPS Ecloud feedback, SPS Ecloud remediation, CRYSTAL collimation experiment, Optical Diffraction Monitor, Coherent Electron Cooling, Collimation Studies at HCX, Space Charge, PS2 Studies, Instrumentation Commissioning, MIA, Phase Advance Analysis.

Graded by the AS Advisory Committee. Decisions:

- Create a LLRF task under Instrumentation
- Redefine the scope of existing Electron Cloud task
- Consolidate Beam-Beam tasks
- Consolidate CRYSTAL+T980 in “Crystal Collimation”
- Create a new “PS2 Studies” task in Accel. Phys.

AS tasks are not proliferating – some died.

Transparency to the proponents is vital.



# Magnet Systems



# FY08 budget – Mag Sys

## LARP FY08 budget version v2d. Final.

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1	<b>Accelerator Systems</b>	<b>Markiewicz</b>		<b>3,063</b>	<b>380</b>	<b>490</b>	<b>1,068</b>	<b>1,125</b>
2	<b>Magnet Systems</b>	<b>Wanderer</b>		<b>6,039</b>	<b>1,583</b>	<b>2,138</b>	<b>2,318</b>	
2.2	<b>Model Quadrupoles</b>	<b>Sabbi</b>		<b>1,027</b>	<b>91</b>	<b>304</b>	<b>632</b>	
2.2.1	TQ							
2.2.1.2	Technology Quad – Collar	Bossert		36		36		
2.2.1.5	Coil/Structure exchange	Ferracin		260		135	125	
2.2.2	HQ							
2.2.2.2	High gradient Quadrupole HQ	Caspi		731	91	133	507	
2.3	<b>Long Quadrupoles</b>	<b>Ambrosio</b>		<b>4,009</b>	<b>1,273</b>	<b>1,629</b>	<b>1,107</b>	
2.3.2	LR							
2.3.2.3	LRS02 assembly & test	Ferracin		413	302		111	
2.3.4	LQ							
2.3.4.1	Coil & collar fab. (FNAL)	Nobrega		1,609		1,609		
2.3.4.2	Coil fab. (BNL)	Schmalzle		951	951			
2.3.4.3	Shell fab.	Ferracin		887	0	0	887	
2.3.4.4	Instruments & Quench Prot.	Felice		149	20	20	109	
2.4	<b>Materials</b>	<b>Ghosh</b>		<b>1,003</b>	<b>219</b>	<b>205</b>	<b>579</b>	
2.4.1	Conductor Support							
2.4.1.1	Strand R&D	Barzi		311	106	205		
2.4.1.2	Cable R&D	Dietderich		552	106		446	
2.4.1.3	Procurement	Ghosh		140	7		133	
3	<b>Program Management</b>	<b>Peggs</b>		<b>2,502</b>	<b>1,077</b>	<b>649</b>	<b>496</b>	<b>280</b>
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	Accelerator Systems			0				
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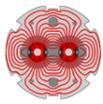


# Magnet R&D plans & GOALS

Reach 200 T/m in “long” Nb<sub>3</sub>Sn quads by the end of 2009  
(LQ: 3.6 m, 90 mm)

Fully qualify Nb<sub>3</sub>Sn magnets by evaluating them for use  
in the LHC by ~2013 (QA: ~4m, ~130 mm)

Enable “LAUC-2” to supply Nb<sub>3</sub>Sn quads for the Phase-2  
IR upgrade ~2017



# Magnet sequence table

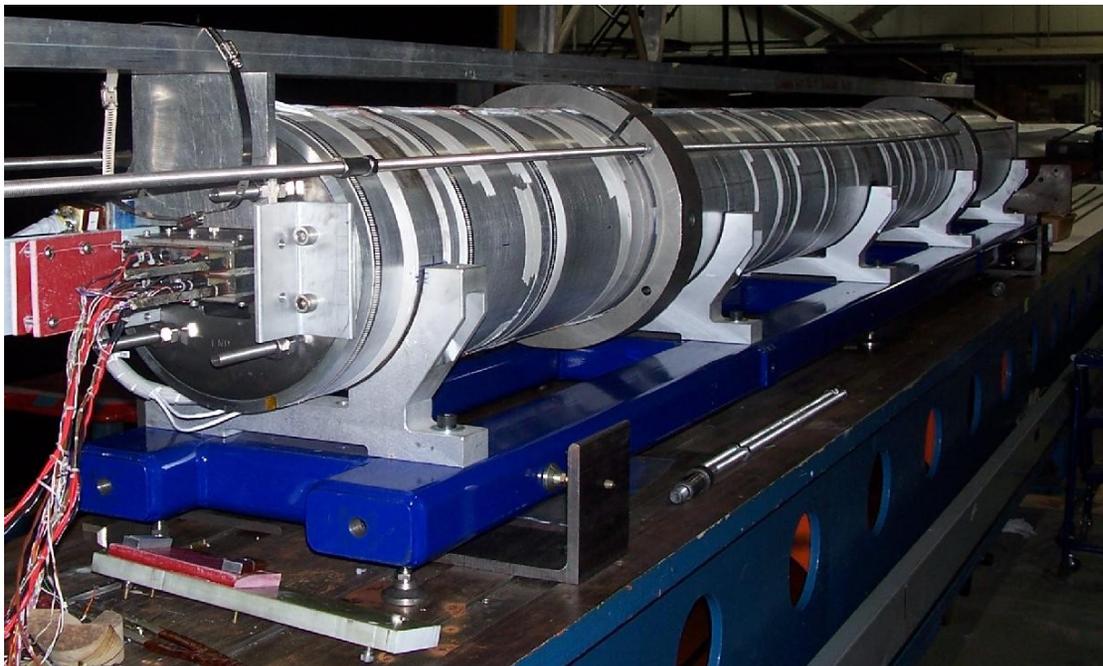
Type	Length [m]	Aperture [mm]	Gradient [T/m]	Peak coil Field [T]	Accelerator Qualities	Purpose	Comment
SQ	0.3	110 - 130	>80	>11	Alignment	Conductor, mechanical and quench studies	Complete
LR	4	0	N/A	>11	None	Length scale-up with racetrack coils	Complete
TQ	1	90	>200	>11	Mag. measurements	Test bed for conductor & LQ	Ongoing
LQ	4	90	>200	>11	Structure alignment	Demonstrate Nb3Sn technology in long mags	2009 goal
HQ	1	~ 130	>175	>13	Field Q & alignment	Short model for QA	High peak field
QA	~ 4	~ 130	~130	~ 10	All	Install in LHC well before Phase 2 upgrade	Slot compatible
QB	tbd	tbd	tbd	tbd	All	Phase 2 upgrade magnet	

**TQ** (Re-)assembly & collaborative testing at CERN.

**LQ** Current focus of attention. Declare victory in battle (but not in war) in 2009?

**HQ** In many ways a model magnet for QA. What are the specs for the Phase-1 upgrade?

**QA** Phase-1 era: **slot compatibility** with NbTi.



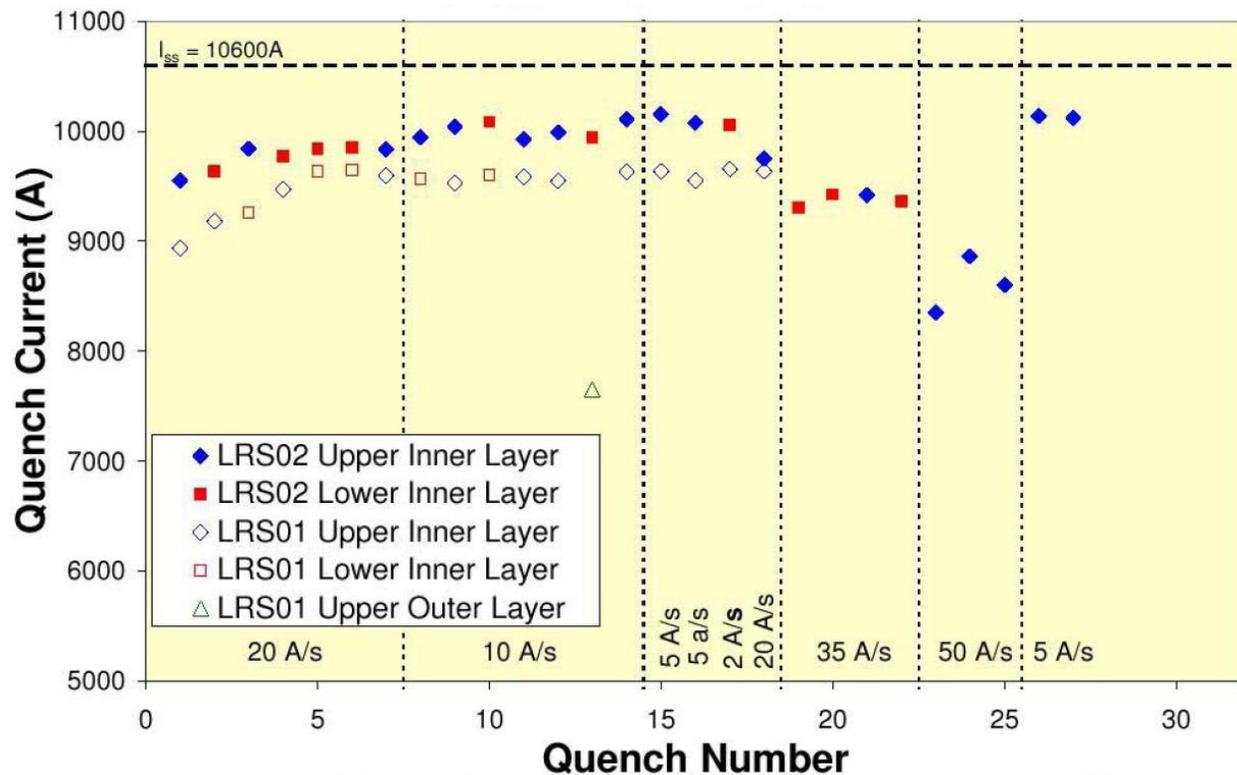
# Long Racetrack (LRS) success

February 08

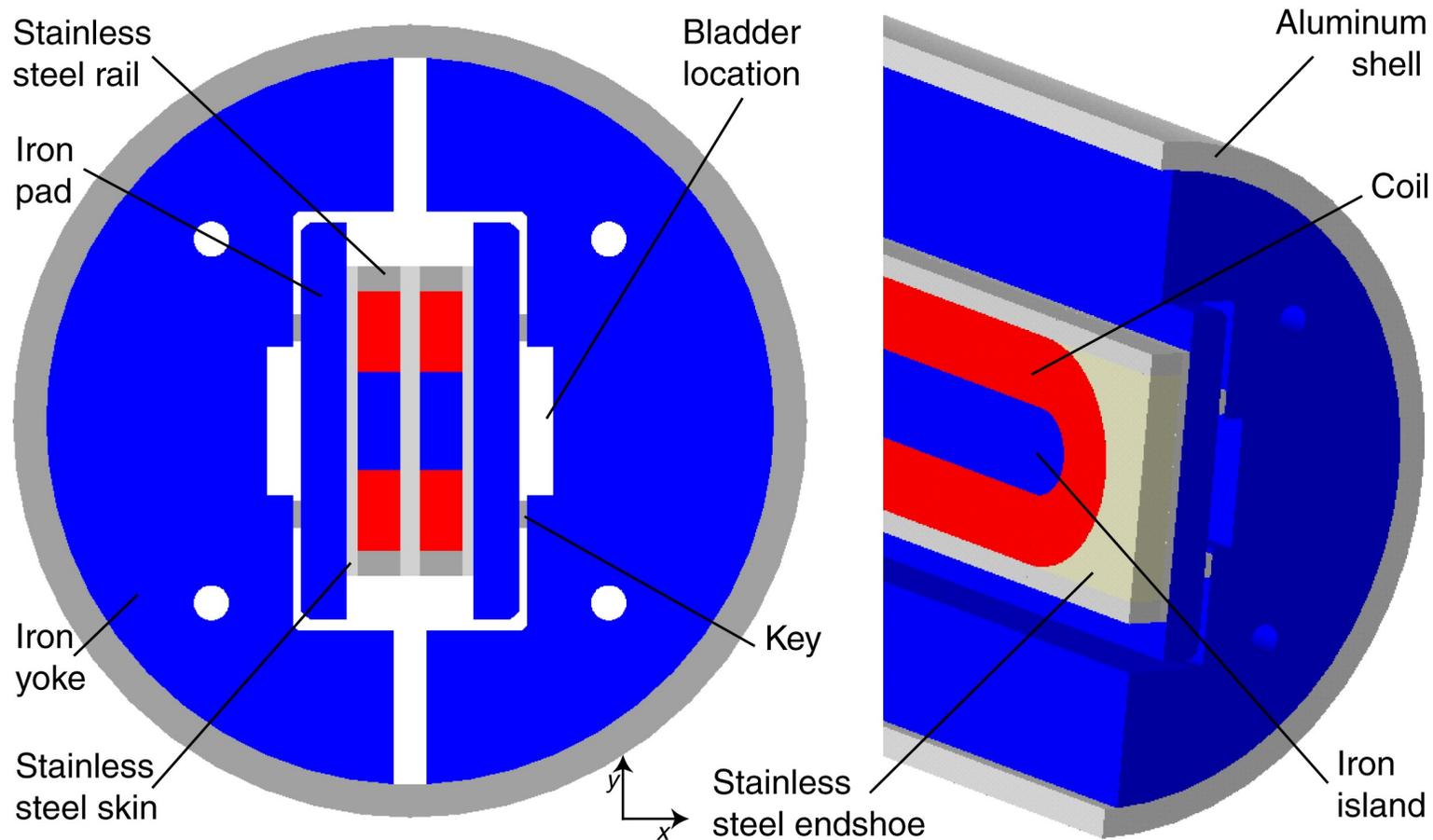
3.6 m: quick, cheap test for length effects in coil manufacture

A 4 meter long  $\text{Nb}_3\text{Sn}$  LR (Long Racetrack) magnet reached **96% of short sample limit.**

LQ (Long Quad) & HQ (High field Quad) series are the next stepping stones toward installation ...

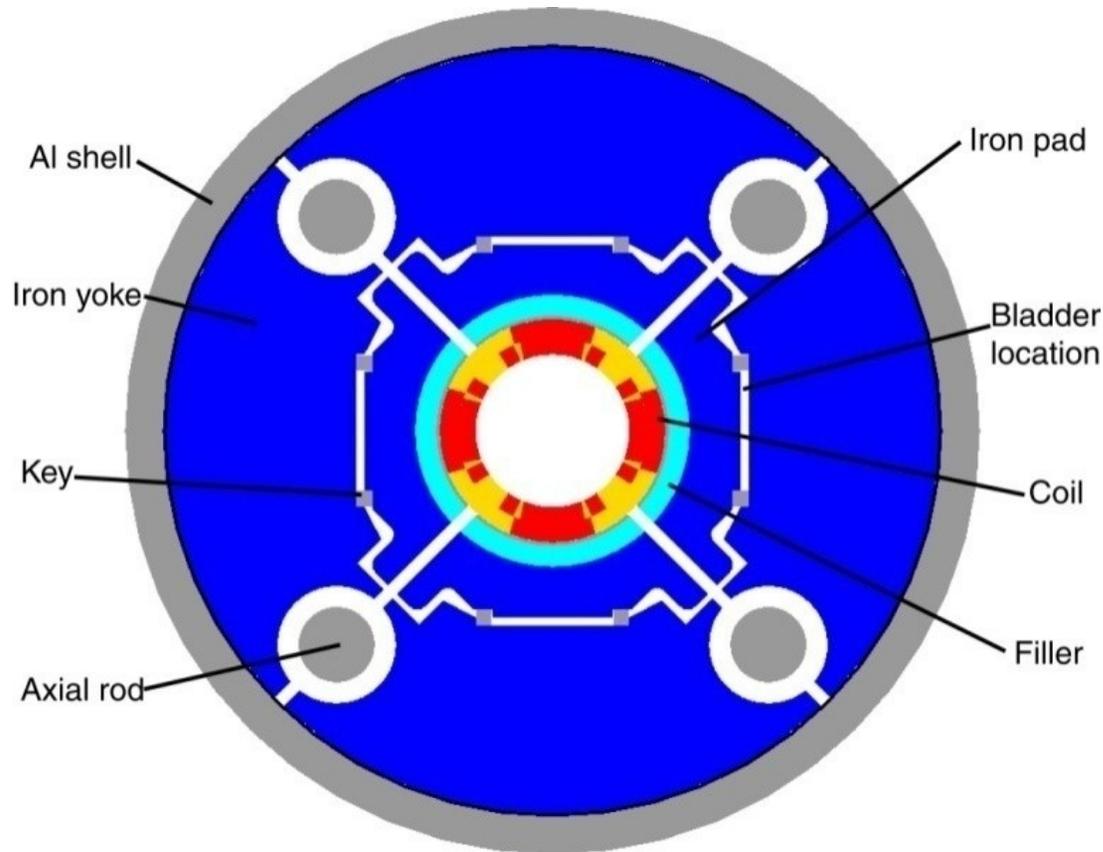


# Yoke & shell strain transients



LRS01 – strain transients due to axial slippage of yoke & shell  
 LRS02 – **segmented** shell, ~1m sections: minor strain transients

## TQ – shell & collar



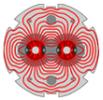
Ten 1 m models tested  
 – reliably achieve 200 T/m

Quick turn-around, relative low cost for future tests:

- conductor materials
- cable with core
- minor structure variants
- multiple thermal cycles

1.9 K model magnet testing at Fermilab or CERN

LBL/CERN -> LARP/CERN Collaboration



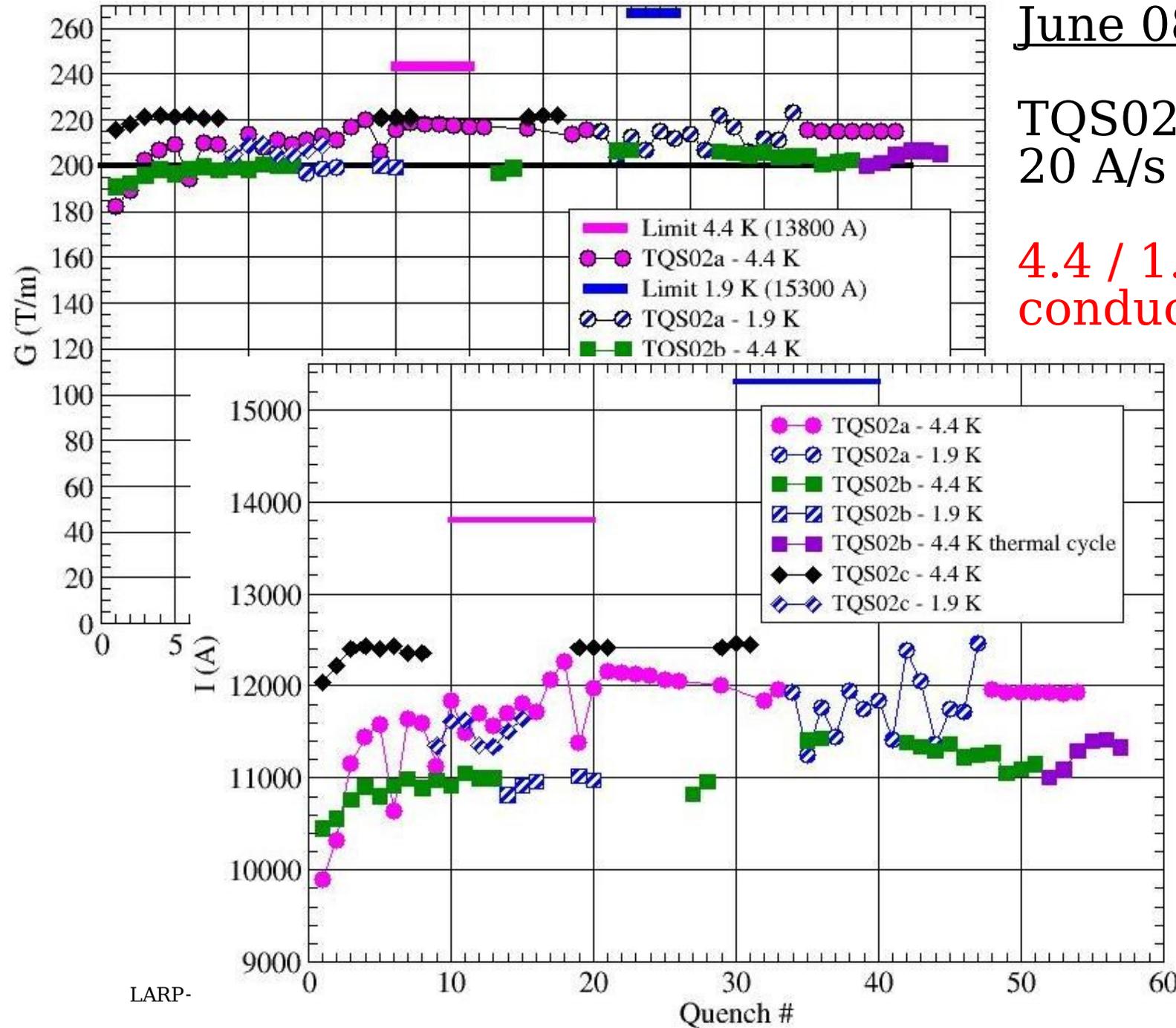
LARP

# TQS02c success

June 08

TQS02c training at 20 A/s (black)

4.4 / 1.9 K mystery: conductor instability?



cf 200 T/m goal for LQ



# LQ test plan at Fermilab

## shell or collar?

LQ01 with **shell-based** structure (Feb 09)  
best performance, rapid assembly, easy coil swapping

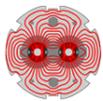
LQ02 with **collar-based** structure (July 09)  
**re-use LQ01 coils** (as done successfully with TQs)

LQ03 with structure depending on previous results?

**THIS MITIGATES RISK**

larger probability of success by the end of FY09

**AFTER LQ LARP WILL PROCEED WITH ONE DESIGN**  
even if both work



# QA Engineering Co-ordination Group

G.Ambrosio (FNAL), M.Anerella (BNL), P.Ferracin (LBNL)

**Goal:** "... set the main mechanical parameters of the QA model and full-length quadrupole cold masses."

**Discussion:** "... HQ short models provide an opportunity for experimental verification of the mechanical structure proposed for QA ... "

"Therefore, the QA engineering coordination group should recommend a mechanical design concept for HQ ..."

"This mechanical concept should include the key accelerator quality features required for QA (alignment, helium containment, heat extraction etc)."



# Program Management



# FY08 budget – Prog Man

## LARP FY08 budget version v2d. Final.

May 16, 2008		Total	Labor+MTSC				
WBS		[\$k]	BNL	FNAL	LBNL	SLAC	
US LHC Accelerator Research Program		<b>11,918</b>	<b>3,040</b>	<b>3,277</b>	<b>3,882</b>	<b>1,405</b>	
1	<b>Accelerator Systems</b>	<b>Markiewicz</b>	<b>3,063</b>	<b>380</b>	<b>490</b>	<b>1,068</b>	<b>1,125</b>
2	<b>Magnet Systems</b>	<b>Wanderer</b>	<b>6,039</b>	<b>1,583</b>	<b>2,138</b>	<b>2,318</b>	
3	<b>Program Management</b>	<b>Peggs</b>	<b>2,502</b>	<b>1,077</b>	<b>649</b>	<b>496</b>	<b>280</b>
3.1	<b>Administration</b>	<b>Peggs</b>	<b>1,922</b>	<b>907</b>	<b>339</b>	<b>436</b>	<b>240</b>
3.1.1	Systems						
3.1.1.1	Accelerator Systems	Markiewicz	517	259	0	63	195
3.1.1.2	Magnet R&D	Wanderer	635	333	214	88	0
3.1.1.3	Programmatic Travel	Peggs	380	95	125	115	45
3.1.1.4	Toohig Fellowship	Peggs	390	220		170	
3.2	<b>Commissioning</b>	<b>Lamm</b>	<b>240</b>	<b>50</b>	<b>110</b>	<b>40</b>	<b>40</b>
3.2.1	Phase I						
3.2.1.1	Beam commissioning	Harms	120	0	40	40	40
3.2.1.2	IR & hardware commissioning	Lamm	20	0	20	0	0
3.2.2	Phase 2						
3.2.2.1	Long Term Visitors	Limon	100	50	50	0	0
3.3	<b>Joint IR Studies</b>	<b>Zlobin</b>	<b>340</b>	<b>120</b>	<b>200</b>	<b>20</b>	<b>0</b>
3.3.1	Simulation						
3.3.1.1	Operating margins	Mokhov	80		80		
3.3.1.2	Accel. Quality & Tracking	Rob.-Dem.	40	40			
3.3.2	Studies						
3.3.2.1	Optics & layout	Johnstone	120	40	80		
3.3.2.2	Magnet feasibility studies	Wanderer	100	40	40	20	
4	<b>Contingency</b>		<b>314</b>				
	Accelerator Systems		0				
	Magnet R&D		314				
	Program Management		0				



# Toohig Fellows

## Rama Calaga (BNL)

- coming to the end of his 2 year term
- continue as task leader for crab cavities
- great success in AB/ABP & CCC

## Helene Felice (LBNL)

- TQ testing at CERN, HQ design at LBNL
- task leader for “Instrumentation & Quench Prot.”

## Riccardo de Maria (BNL)

- recent start, establishing his focus within PS2
- FODO lattice or Imaginary gamma-T?
- 1 W/m puts MI(upgrade), J-PARC & PS2 in new class

**Another** Toohig Fellow has just informally accepted ...



## Long Term Visitors

The first batch of LTVs are about to go to CERN:

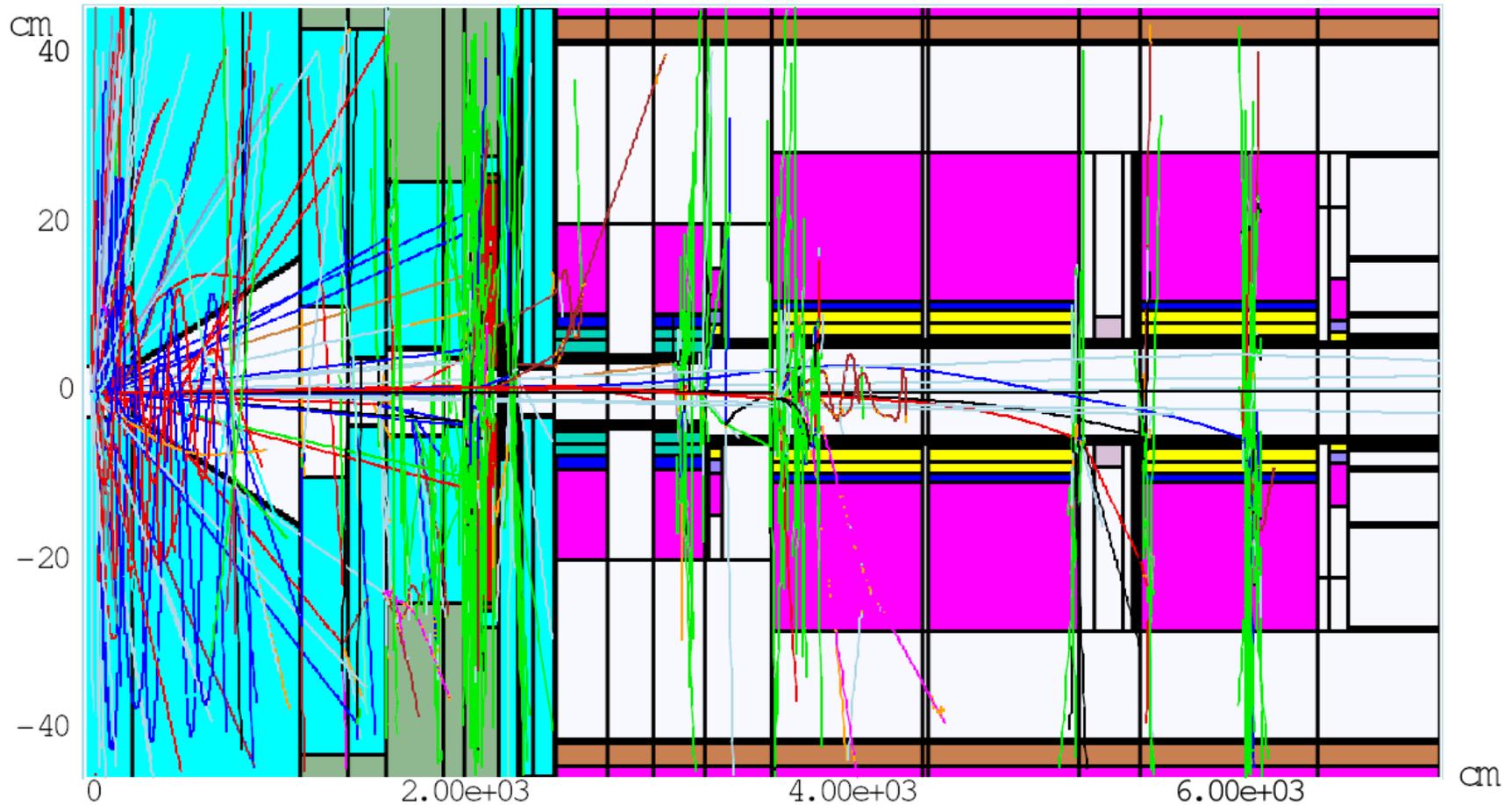
Eliane Gianfelice (FNAL)	4 months
Steve Peggs (BNL)	12 months
James Strait (FNAL)	12 months

This has long been under deliberation – too soon to report on how well (or poorly) it is functioning

Some teething problems, but thanks go to Peter Limon for re-vamping procedures and establishing rules.

# Joint IR Studies

Eg, energy deposition at 7x7 TeV



Particle tracks ( $E > 5$  MeV) for 1 pp-event at 7x7 TeV



# JIRS Mission

## Founding Mission Statement (Sept 2007):

- 1) Define and evaluate a short list of potential QA locations at CERN, based on clearly established criteria, ...
- 2) Develop appropriately strict or relaxed specifications for the magnetic and accelerator-quality parameters of QA magnets ...
- 3) Examine the possibility of using LQ or HQ-derived designs and tooling to build QA magnets.
- 4) Identify bench tests on QA or LQ or HQ magnets that would help explore & demonstrate accelerator quality performance ...

The world has changed since then (LAUC) – **this mission needs a fundamental revision.**

JIRS must work harmoniously with CERN!



# Summary



# Summary

- 1) LARP does R&D, LAUC does construction!
- 2) LARP & LAUC are separate, with co-ordinated strategies.
- 3) LARP MUST fund “LAUC Planning for CD-2 in summer 09, in any financial scenarios (12, 13 or 18 M\$).
- 4) A 6 month Continuing Resolution would/will hurt, especially with LAUC CD-2 commitments.
- 5) We have defined a 5-year magnet plan at a turning point:
  - LQ is about to meet its 2009 goal (long, strong quad)
  - declined (with regrets) Nb3Sn quads in 2013 Phase-1
  - new LARP leader



# Summary

- 6) IR & Hardware Commissioning has been a great success – thank you, unsung heroes!
- 7) The Joint IR Studies mission statement needs revision.
- 8) How to make Accelerator Physics PhDs with reduced HEP \$\$\$s?
- 9) Collaborate or die.
- 10) Welcome, Eric – may you live in exciting times!