World Wide Study Detector R&D Panel
Project Registry Web Site

Daniel Peterson, Cornell University

web site: https://wiki.lepp.cornell.edu/wws/bin/view/Projects/WebHome

Panel Charge

How the information on the page answers the charge

Project organization (accommodating groups, projects, and super-projects)

Participation

Our charge

1. Create and maintain a register of ongoing R&D programs relevant for LC experiments,
   which should include R&D goals
   and schedules,
   names of participating institutions
   and their responsibilities,
   relevant publications,
   level of support,
   and web-links to current work.

   The R&D programs should include not only those required for the proposed detector concepts,
   but also those needed for measurements of luminosity, energy, and polarization (LEP)
   and those associated with the masking system, possible beam EMI,
   and other areas which may a overlap with MDI.

   The registration of such MDI projects should be performed jointly with the MDI panel.
   Maintain a central web repository for this information, and update it regularly.

2. Survey the R&D relevant for LC experiments.
   This survey should review the R&D needs of all candidate detector concepts,
   LEP measurements, and relevant MDI issues as discussed above.
   It should strive to identify the critical R&D items which affect the viability of each concept
   and uncover any needed R&D which is not being pursued. In addition, it should
   encompass the existing R&D efforts, assess the relevance of these efforts to the various detector concepts
   and LEP or MDI needs, and flag areas needing more attention.
   Document this survey before August, 2005.

6-June-2005 It was agreed that the R&D panel would prepare a report on the status of detector R&D programmes by the end of 2005 - on the same timescale as the report on accelerator R&D which Barry Barish (BB) is asking the GDE to produce - primarily aimed at the funding agencies

Our charge, continued

3. Critically review the Status of R&D Relevant for LC experiments.
   An important input for this review will be the Spring 2006 Detector Outlines,
   which will be requested from each of the current design studies by the World Wide Study Organizing Committee.
   Each outline will include an introduction to the detector concept,
   a description of the detector, its expected performance,
   subsystem technology selections or options, status of ongoing studies,
   and a list of R&D needed.
   Additional input will come from reassessing the ongoing R&D efforts with
   respect to relevance and importance,
   current level of effort,
   scheduled project completion times,
   duplication of effort, and additional resources required.
   Document this review by Summer, 2006.

4. Register the regional review processes for LC detector R&D.
   In consultation with the ILCSC and the GDE,
   facilitate review for R&D proposals which are not easily incorporated into these existing review structures.

5. Continue these activities,
   and **whatever** further activities are judged important to prepare needed R&D for LC detectors,
   until a global lab assumes these responsibilities.

The pages: home page

Register of Detector R&D Projects

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The World Wide Study Organizing Committee (WWSOC) has established the Detector R&D Panel to promote and coordinate detector R&D for the International Linear Collider.

Panel Charge

Panel Members:

- Europe
  - Chris Damerell (Rutherford Lab.,UK)(chair) mail
  - Jean-Claude Brient (Ecole Polytechnique, France) mail
  - Wolfgang Lohmann (DESY-Zeuthen, Germany) mail
- ASIA
  - HongJoo Kim (Kyungpook National U., Korea) mail
  - Tohru Takeshita (Shinsu U., Japan) mail
  - Yasuhiro Sugimoto (KEK, Japan) mail
- North America
  - Daniel Peterson (Cornell U., USA) mail
  - Ray Frey (U. of Oregon, USA) mail
  - Harry Weerts (Fermilab, USA) mail

Detector R&D projects are organized under these topics

- Luminosity, Energy, Polarization and Machine Detector Interface, LEP/MDI
- Vertexing, VTX
- Tracking - silicon and forward, TRACK-si,for
- Tracking - TPC, TRACK-TPC
- Calorimetry (ECAL, HCAL, forward), CAL
- Muon System, MUON
- Particle ID, PID
- Data Aquisition Systems, DAQ

Instructions for new entries to the Detector R&D Panel Register

The pages: main project page

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Project: Digital Hadron Calorimeter with RPCs

Contact: José Repond (Argonne National Laboratory, USA) mail

Topic: Calorimetry

Assisting Panel Member: Ray Frey

Collaborating Institutions: Argonne National Laboratory, Boston University, University of Chicago, Fermilab, University of Iowa - (collaborators)

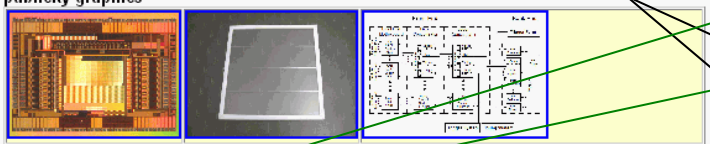
Detector Concept Affiliation: SiD

web page: http://www.hep.anl.gov/repond/DHCAL_US.html

recent presentations/publications:

- L.Xia: RPC for an Active Medium of the DHCAL, LCWS'05: (pdf)
- J.Repond: DHCAL Prototype Construction, LCWS'05: (pdf)

publicity graphics



DCAL chip | RPC prototype | Conceptual design of electronic readout

Research Statement

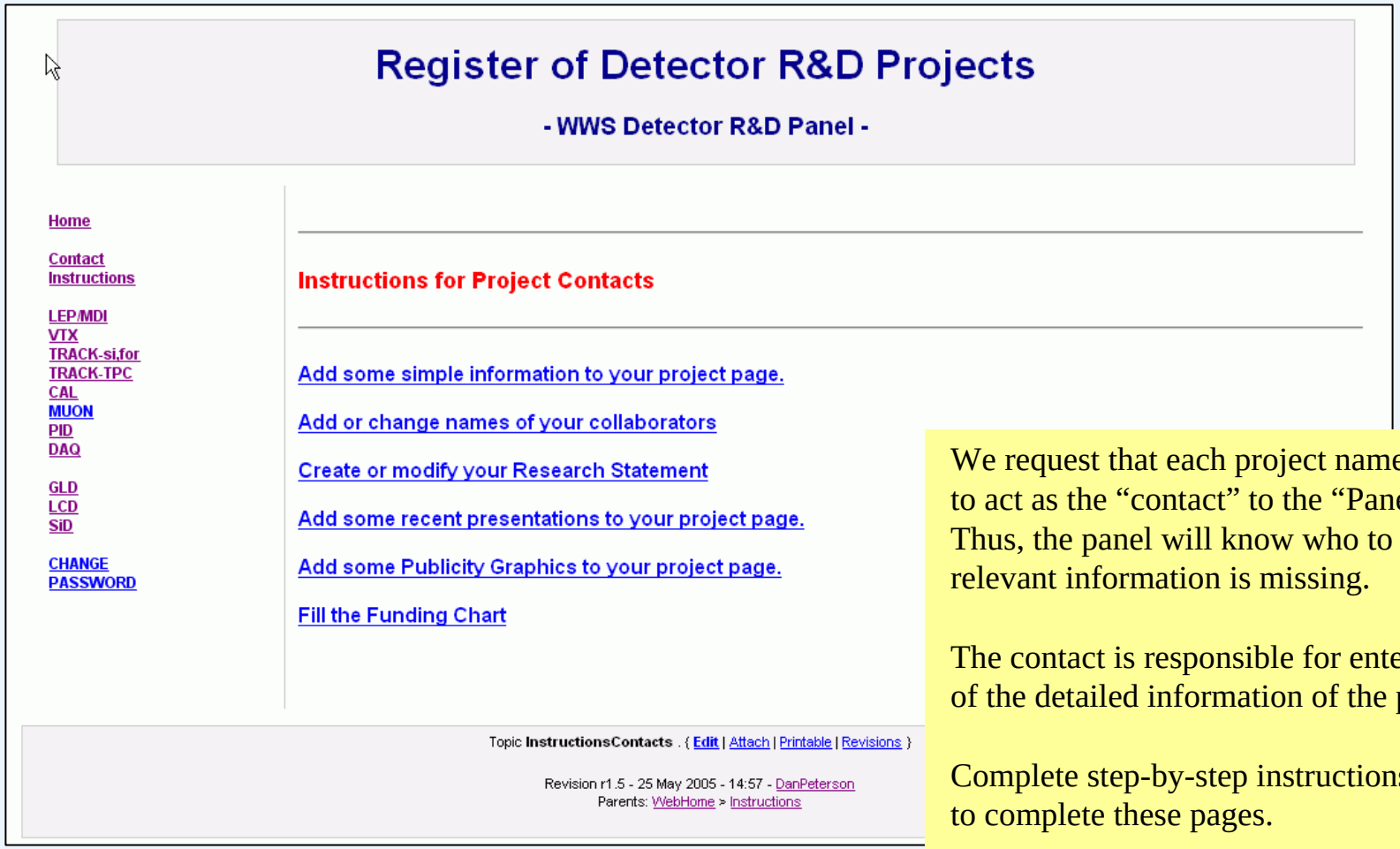
Funding

Topic CalArgonneRPC . { Edit | Attach | Printable | Revisions }

Revision r1.9 - 21 Jun 2005 - 12:22 - JoseRepond
Parents: WebHome > Instructions > CreateProjectPage

1. Create and maintain a register of ongoing R&D programs relevant for LC experiments, which should include R&D
   goals and schedules,
   names of participating institutions
   and their responsibilities,
   relevant publications,
   level of support, and
   web-links to current work.

The pages: instructions



We request that each project name a person to act as the "contact" to the "Panel". Thus, the panel will know who to call when relevant information is missing.

The contact is responsible for entering most of the detailed information of the project pages.

Complete step-by-step instructions are provided to complete these pages.

(Find the error in one of the instructions !)

The pages: collaborators

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"Digital Hadron Calorimeter with RPCs"

Argonne National Laboratory, USA

- Gary Drake mail
- Victor Guarino mail
- José Repond mail
- Dave Underwood mail
- Barry Wicklund mail
- Lei Xia mail

Boston University, USA

- John Butler mail
- Menakshi Narain mail

University of Chicago, USA

- Mark Oreglia mail

Fermilab, USA

- Jim Hoff mail
- Abderrezak Mekkaoui mail
- Ray Yarema mail

University of Iowa, USA

- Edwin Norbeck mail
- Yasar Onel mail

Topic **CalArgonneRPCCollaborators** . { Edit | Attach | Printable | Revisions }

Revision r1.4 - 21 Jul 2005 - 11:45 - DanPeterson
Parents: WebHome > Instructions > CreateProjectPage > CalArgonneRPC

Statement Questions

"Please address the following questions in your statement. "

What are the goals of this R&D project.
How does this R&D project address
the needs of one or more of the detector concepts?

If there are multiple institutions participating in this project,
please describe the distribution of responsibilities.

Are there significant recent results?

What are the plans for the near future (about 1 year)?
What are the plans on a time scale of 2 to 3 years?

Are there critical items that must be addressed before
significant results can be obtained from this project?

Is the support for this project sufficient?
Are there significant improvements that could be made with additional support?

Goals, schedules and responsibilities to meet the first paragraph of the charge.

This is to provide more information regarding "level of support".

2. Survey the R&D relevant for LC experiments.
   This survey should review the R&D needs of all candidate detector concepts, LEP measurements, and relevant MDI issues as discussed above.
   It should strive to identify the critical R&D items which affect the viability of each concept and uncover any needed R&D which is not being pursued.
   In addition, it should encompass the existing R&D efforts,
   assess the relevance of these efforts to the various detector concepts and LEP or MDI needs,

The pages: "research statement"

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"Digital Hadron Calorimeter with RPCs"

We develop a Hadron Calorimeter for the Linear Collider, which will be optimized for the application of Particle Flow Algorithms (PFAs). The latter request a calorimeter with extremely fine segmentation of the readout, of the order of 1 cm^2 latteraly and layer-by-layer longitudinally. We propose to achieve this fine segmentation using Resistive Plate Chambers as active medium. Due to the fine segmentation of the readout a simple digital (one-bit resolution) readout is sufficient to provide the necessary energy resolution for single hadrons. Both the SiD[2] and the LDC concepts feature a digital hadron calorimeter with RPC readout as default option for the hadron calorimeter.

We plan to build a prototype hadron calorimeter section with 400,000 readout channels. We completed the R&D on the chambers and will complete the prototyping of the electronic readout system in calendar year 2005. In calendar year 2006 we will construct the prototype section (120 RPCs), provided our funding requests will be approved (see below).

In 2007 we will move to the FNAL MT6 test beam. The purpose of exposing the prototype section to a test beam is a) to measure hadronic showers with unprecedented spatial resolution, b) to validate the simulation of hadronic showers in great detail (a prerequisit for optimizing the Linear Collider detectors with respect to the application of PFAs), c) to validate the concept of a digital hadron calorimeter, d) to validate our technical approach to a fine granularity hadron calorimeter using RPCs, and finally e) to compare the performance with a more traditional approach based on scintillator and analog (multi-bit) readout being developed in Europe.

Of course, our plans can only be realized with significant support from the funding agencies. The cost of the prototype section is estimated to be of the order of $1M. Funding proposals have been submitted to both the DOE and the NSF. So far the results have been totally inadequate.

Please address the following questions in your statement.

- What are the goals of this R&D project. How does this R&D project address the needs of one or more of the detector concepts?
- If there are multiple institutions participating in this project, please describe the distribution of responsibilities.
- Are there significant recent results?
- What are the plans for the near future(about 1 year)? What are the plans on a time scale of 2 to 3 years?
- Are there critical items that must be addressed before significant results can be obtained from this project?
- Is the support for this project sufficient? Are there significant improvements that could be made with additional support?

Topic **CalArgonneRPCStatement** . { Edit | Attach | Printable | Revisions }

The pages: funding

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"Development of thin silicon sensors for tracking "

Funding:

year	equipment	consumables	Academic Staff	Students	Support Staff
	(k US$)	(k US$)	(FTE)	(FTE)	(FTE)
2004					
2005					

year: This may be a fiscal year, not starting on 1-January, having more than 50% overlap with the calender year.

equipment:

This is intended to include hardware newly purchased for this project with funds from all sources: university funds, department/group base grant, and Linear Collider R&D grants. This includes, for example, power supplies, circuit boards, GEMs, silicon wafers, and scintillators.

This includes materials for structural detector parts. If the fabrication or machining of structural detector parts is purchased from sources outside of your collaboration's facilities, that would be a part of the equipment cost. However, if fabrication or machining is performed in-house, that work would be shown under "staff".

This should **not** include the cost of consumables or personnel funding that may have come from the same sources. This should also **not** include overhead. This does include newly purchased computers used principally for data aquisition but **not** computers purchased to become part of a department analysis infrascructure nor a laptop for personal use.

consumables:

This is intended to include chamber gas, clean room supplies, pencils, tape, *etc*, which are purchased specifically for this project. This is also intended to include travel and other expenses associated with test beam runs.

**k US$** The unit for "equipment" and "consumables" is 1000US$. Assistance in converting to US$ can be found here.

Academic Staff includes faculty, senior scientists, and post-docs.

Students includes graduate students, undergraduate students, and summer program participants.

The funding information may be viewed by the panel.

It is not public.

Project Organization: accommodating groups, projects, and large collaborations

The panel is asked to assess "R&D programs". The panel is assessing "programs", not "institutions".
Programs, or "projects" might be logically defined as endeavors that might be defined by a result or test facility with the intellectual effort shared by a group (those who would normally be listed on a publication).

What is sometimes presented to the Panel as a "program" or "project" can vary significantly in scale.
Some projects may include only a few active people while CALICE lists 179.

The responsibility of assess the "relevance of these efforts to the various detector concepts" is made more difficult given a large collaboration with diverse research efforts.

Given a single "statement" from a "contact" of one of the large collaborations, it may be difficult for the panel to absorb
how various R&D needs of a detector concept are met by the various sub-projects within that large collaborations,
how the responsibility is shared by the participating institutions, and
what is the level of support of the various activities.
Separate pages for the various sub-projects within the large collaborations will help the panel by
providing organization to the sub-projects and
providing a venue for those closely involved in each sub-project to explain the goals, relevance and funding.

However, there may be benefits to reinforcing the cohesiveness of the large collaborations.
There may be sub-projects within the large collaboration on which members, who might have previously worked on definable smaller projects, will work together.
Thus, there are benefits to providing project pages describing the activities of the large collaboration.

Project Organization: accommodating groups, projects, and large collaborations

To satisfy the needs of the large collaborations and the individual projects,
as well as providing the information required by the Panel to satisfy its charge,
we have a system of

providing pages for both the collaborations and the sub-projects,
showing both on the table of contents
identifying the affiliation with the larger collaboration in the table of contents, and
providing links to/from the large collaboration and the sub-projects.

Pages for both the large collaboration and the sub-projects have
"statement" pages and "funding" pages.

The Large-Collaboration/Sub-Project structure currently is being implemented for
LC-TPC and SiLC.

It may be relevant to implement this structure for CALICE and LCFI.

Participation: 43 projects

project	panel	wws	date	concept	web	present	graphic	collab	state-ment	fund	complete but fund	complete	not touched	problems
		oc			page									
LEP Wayne Beamstralung			20-May		x									
LEP darebury Palarised			23-May		x	x	x	x	x		x			link to work
LEP CERN Luminosity			23-May		x									Institution li
LEP London Luminosity		x	23-May		x			x	x					statement r
LEP Iowa Parairmeter			26-May										x	
LEP Iowa Luminosity			26-May										x	
LEP Iowa State Cherenkov			1-Jul		x									
LEP Notre Dame			1-Jul										x	
VTX MPI DEPFET			5-May		x	x	x	x						very big gro
VTX KEK CCD	x		27-Apr		x			x						
VTX AGH SOI			11-May		x	x	x	x	x	x		x		
VTX IReS CMOS			11-May										x	
VTX Bristol Liverpool..,LCFI	x		12-May	x	x	x	x	x	x		x			collaborato
VTX Oregon/Yale		x	20-May										x	
VTX Berkeley Pixel			23-May										x	
TRK slifor SILC Collaborative			16-Aug	x				dpp					x	
TRK slifor LPNHE Paris			9-Jun										x	
TRK slifor Michigan Align			3-May		dpp	x	dpp	dpp	x		x			
TRK slifor UCSC long shape			11-May	dpp	dpp	dpp							x	
TRK slifor Kyungpook mstrip			18-May										x	
TRK slifor Charles Prague			16-Aug	dpp									x	
TRK slifor Purdue thin			12-May			dpp	dpp	dpp					x	
TRK slifor Kansas Cal assist			2-Jun	dpp	dpp	dpp	dpp	dpp					x	
TRK-TPC collaboration		x	1-Jun	dpp	dpp			dpp	x					
TRK-TPC Cornell/Purdue	x		25-Apr	x	x	x	x	x	x	x		x		statement r
TRK-TPC Victoria		x	4-May	x	x	x	x	x	x	x		x		
TRK-TPC MPI		x	18-May	dpp	dpp	dpp	dpp	dpp	x	x		x		
TRK-TPC CDC			29-May		x	dpp	dpp	dpp						
TRK-TPC LBNL/Orsay/Saclay			2-Jun	dpp		dpp	dpp	dpp					x	
TRK-TPC Carleton dispersion			1-Jul		dpp	dpp							x	
TRK-TPC LBNL VLSI readout			23-May										x	
CAL Oregon SiW	x		25-Apr	dpp	x	x	x	x	x	x		x		
CAL Colorado Offset Tile			18-May										x	
CAL DESY-Zeuthen forward	x		19-May		x		x	x						
CAL U Iowa PFA			23-May	x	x			x						
CAL Argonne digital H cal			26-May	x	x	x	x	x	x	x		x		
CAL CALICE	x	x	26-May		x			dpp	x					
CAL GLD-CAL			2-Jun	dpp	x	dpp	x	dpp	x		x			
CAL UTA GEM H cal			2-Jun			dpp		x	x					
CAL U Kansas part flow			9-Jun										x	
CAL Texas Tech DREAM			1-Jul										x	
MUON Frascati CAPIRE			23-May			dpp	dpp						x	
Muon Wayne Scint			9-Jun		dpp	dpp							x	
									14		4	6	21	

Meeting the needs of the panel to satisfy the charge

Participation is low.
There are 43 registered projects (including the large collaborations).

Yet, there are only 6 complete projects.
By not requiring the funding page (there is resistance), one could count 10 “complete” projects.

There are 14 projects that have attempted to provide the “statement”. This is probably the most important input for assessing the relevance of these efforts to the various detector concepts.

The Panel does not have the information required to complete our report.

We need more projects to register.

The panel must become aggressive. We must soon

review the information provided in the current project pages,
determine if that information answers the questions we have asked, and
encourage the project contacts to provide any missing information.

The panel requires the input from the concepts.
This will then be made available on the web site for review by the research groups and the Panel members.