

Proposal for a Common Web Portal for Beam Instrumentation

Industry meets Academia: Beam Monitoring
Instrumentation and Quality Assurance – 23/09/2011

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Presentation Overview

- This talk will present an initiative launched during the recent International Particle Accelerator Conference (IPAC11) to define and produce a **Common Web Portal for Beam Instrumentation**
- The Triggers
- The Aims
- The Proposed Solution
- The Plan
- The Current Prototype
- The Role of the Local Admin
- The Next Steps
- Conclusions

The Trigger

- Over the past year, the requirements of the LHC Experiments have put a lot of pressure on the LHC beam current transformers.
- Their request was quite clear - not only to get the best possible performance from the beam current monitors but also to quantify precisely the uncertainty of these measurements.
- This turned out to be a difficult and challenging task and we realized during this process that there was **no easy way to share our issues, questions and progress with people probably facing the same kind of problems.**

The Aim

- Build 'something' that would allow beam instrumentalists to:
 - Easily find the laboratories with machines using beams of similar characteristics (particle type, total beam intensity, bunch intensity, frequency, energy...)
 - Easily find who is the person working there on the beam observable concerned (i.e. beam position, loss, intensity, transverse or longitudinal profile, tune...) and how to contact him/her.
 - Launch discussion forums with the right persons
 - Advertize such events as this workshop
 - Provide links towards documents describing system designs and performance assessments
 - And possibly more ...

The Proposed Solution

- The proposed solution is to develop **a web site providing all the relevant features to host and maintain this data** (i.e. machine and beam parameters, instrument and expert lists...), calendar and discussion forums
- Each participating laboratory would nominate a **local administrator to maintain the data** (i.e. machine and beam parameters, instrument and expert lists, local events...) of each laboratory
- **Each BI expert could then use the site info,** create/participate to discussions...

The Plan

- The plan we discussed between several BI colleagues in IPAC'11 was:
 - For the end of 2011
 - Make a first prototype of this web site to
 - Assess feasibility and usefulness
 - Precise the details
 - Define the data visibility and maintenance policy...
 - Get some local administrators to feed the site with valid data
 - For 2012 (if feasibility and usefulness are confirmed)
 - Decide whether the proto could be the final one
 - Ensure long term support for the site core engine
 - Complete data from participating laboratories
 - **Propose the site to other laboratories during IBICS'12**

The Current Prototype: <https://espace.cern.ch/info-bi-portal>

Home - World Portal for Beam Instrumentation - Windows Internet Explorer provided by CERN

https://espace.cern.ch/info-bi-portal/default.aspx

Site Actions Browse Page

World Portal for Beam Instrumentation

Home Stats

Search this site...

BI Portal

Laboratories

Machine Overview

Beam Instrumentation

Instrument Technology

Documentation

Related Events

Discussions

Discussions

People and Groups

Temporary Links

Machine Types

Beam Observables

Particle Types

Internal Documentation

Temporary Sites

Recycle Bin

All Site Content

Introduction

Welcome to the Beam Instrumentation World Portal

The purpose of this site is to provide an easy and efficient way to share design, issues, questions and progress on particle accelerators beam instrumentation between experts from the different laboratories.

This site should allow beam instrumentation experts to:

- find the laboratories with machines producing beam with similar characteristics (particle type, total beam intensity, bunch intensity, frequency, energy...)
- find who is the colleague working there on the beam observable concerned (i.e. beam position, loss, intensity, transverse or longitudinal profile, tune...) and how to contact him
- find documents describing their system designs and performance assessments

You will find below the list of Laboratories participating to this initiative.

You will find on your right ongoing discussions if any.

You will find on your left, under BI Portal chapter, access to:

- the list of Laboratories participating to this web site
- the relevant Beam and Machine Parameters for the different machines (*Machine Overview*)
- a list and some literature for the different monitor technologies used in Beam Instrumentation (under *Instrument Technology*)
- a list of the instruments (*Beam Instrumentation*) deployed on the different machines with some key informations like their main technology or the contact person
- a library for relevant *Documentation* on these instruments
- You also have access to the *Discussion* page where you should be able to launch a new one if you fill the need.
- the *Machine Types*, *Beam Observables* and *Particle Types* lists will eventually be hidden. They are used as input for the other lists and exposed here for the purpose of discussion.

Participating Laboratories

<input type="checkbox"/> Acronym	Name and Web Site	Country	Location
Count= 13			
BNL	Brookhaven National Laboratory	USA	Brookhaven
CELLS-ALBA	ALBA Synchrotron Light Facility	Spain	Barcelona
CERN	European Laboratory for Nuclear Research	Switzerland	Geneva
DESY	Deutsches Elektronen-Synchrotron	Germany	Hamburg
DIAMOND	Diamond Light Source - UK's National Synchrotron	UK	Oxfordshire
ESS	European Spallation Source	Sweden	Lund
FNAL	Fermi National Accelerator Laboratory	USA	Chicago
GSI	GSI Helmholtzzentrum für Schwerionenforschung	Germany	Darmstadt
KEK	High Energy Accelerator Research Organization	Japan	Tsukuba
ORNL	Oak Ridge National Laboratory	USA	Oak Ridge
PSI	Paul Scherrer Institute	Switzerland	Villigen
RIKEN	RIKEN	Japan	Wako
SOLEIL	SOLEIL Synchrotron	France	Saclay

Related Events

10/11/2011 12:00 AM Beam Monitoring: Developments and Applications

An initiative to bring together the brightest minds in the field from both academia and industry. This workshop serves as a platform to present and discuss current developments and standing issues, to find synergies and common grounds.

Add new event

Ongoing Discussions

<input type="checkbox"/> Subject	Replies	Last Updated
Another subject on DCCT in storage rings	2	09/11/2011 12:22 PM
Dummy subject for test purpose	4	09/11/2011 12:13 PM
Negative Comments on this Sharepoint Site Functionality	8	19/10/2011 06:09 PM
Comments on the List of Machine Overview	4	26/09/2011 04:46 PM
Comments on the List for Beam Instrumentation	1	22/09/2011 03:14 PM
Positive Comments on this Sharepoint Site Functionality	5	21/09/2011 04:37 PM
Discussion on Steering Committee	0	21/09/2011 04:04 PM
Discussion on Access Rights to this Site	0	20/09/2011 03:48 PM
Discussion on Data Update Frequency	0	20/09/2011 03:47 PM
Discussion on Laboratory Linkperson Role	0	20/09/2011 03:47 PM
Comments on the List for Documentation	0	20/09/2011 03:38 PM
Comments on the List of Machine Types	0	20/09/2011 03:37 PM
Comments on the List of Laboratories	0	20/09/2011 03:37 PM
Comments on the List of Particle Types	0	20/09/2011 03:34 PM
Comments on the List of Instrument Technologies	0	20/09/2011 03:34 PM
Comments on the List of Beam Observables	0	20/09/2011 03:33 PM

Local intranet 100%

The Current Prototype: The Instrument Technologies

World Portal for Beam Instrumentation ▶ Instrument Technology ▶ All Items ▾			
Home	Stats	Search this site... 🔍 ?	
BI Portal	<input type="checkbox"/> Technology	Main Observables	Litterature
Laboratories	Beam Induced Fluorescence Monitor	Transverse Distribution	Lecture notes on beam instrumentation and diagnostics [Joint University Accelerator School 2011]: http://www-bd.gsi.de/conf/juas/juas_script.pdf
Machine Overview	Current Transformer for Pulsed Beam	Intensity	Lecture notes on beam instrumentation and diagnostics [Joint University Accelerator School 2011]: http://www-bd.gsi.de/conf/juas/juas_script.pdf
Beam Instrumentation	DC Current Transformer	Intensity	Lecture notes on beam instrumentation and diagnostics [Joint University Accelerator School 2011]: http://www-bd.gsi.de/conf/juas/juas_script.pdf
Instrument Technology	Faraday Cup	Intensity	Lecture notes on beam instrumentation and diagnostics [Joint University Accelerator School 2011]: http://www-bd.gsi.de/conf/juas/juas_script.pdf
Documentation	Ionization Chamber	Losses	Lecture notes on beam instrumentation and diagnostics [Joint University Accelerator School 2011]: http://www-bd.gsi.de/conf/juas/juas_script.pdf
Related Events	Multi Wire Proportional Chamber	Transverse Distribution	Lecture notes on beam instrumentation and diagnostics [Joint University Accelerator School 2011]: http://www-bd.gsi.de/conf/juas/juas_script.pdf
Discussions	Pick-Up (capacitive, inductive)	Position	Lecture notes on beam instrumentation and diagnostics [Joint University Accelerator School 2011]: http://www-bd.gsi.de/conf/juas/juas_script.pdf
Discussions	PIN Diode	Losses	Lecture notes on beam instrumentation and diagnostics [Joint University Accelerator School 2011]: http://www-bd.gsi.de/conf/juas/juas_script.pdf
People and Groups	Residual Gas Profile Monitor (Ionisation)	Transverse Distribution	Lecture notes on beam instrumentation and diagnostics [Joint University Accelerator School 2011]: http://www-bd.gsi.de/conf/juas/juas_script.pdf
Temporary Links	Schottky Monitor		Lecture notes on beam instrumentation and diagnostics [Joint University Accelerator School 2011]: http://www-bd.gsi.de/conf/juas/juas_script.pdf
Machine Types	Scintillation Counter	Losses: Intensity	Lecture notes on beam instrumentation and diagnostics [Joint University Accelerator School 2011]: http://www-bd.gsi.de/conf/juas/juas_script.pdf
Beam Observables			
Particle Types			
Internal Documentation			
Temporary Sites			

This gives the list of the different families of instruments (with the main observables they cover and some introduction documentation) that are covered in this site

The Current Prototype: The Participating Laboratories

The screenshot shows a web application interface for the 'World Portal for Beam Instrumentation'. The top navigation bar includes 'Site Actions', 'Browse', 'List Tools' (with sub-items 'Items' and 'List'), and a user profile 'Jean-Jacques Gras'. The main header area displays the portal's name and a breadcrumb trail: 'World Portal for Beam Instrumentation > Laboratories > All Items'. Below this, a sub-header reads 'List of Laboratories participating to the portal'. A search bar on the right says 'Search this site...'. On the left, a sidebar menu lists various categories: 'BI Portal', 'Laboratories' (highlighted), 'Machine Overview', 'Beam Instrumentation', 'Instrument Technology', 'Documentation', 'Related Events', 'Discussions', 'People and Groups', 'Temporary Links', 'Machine Types', 'Beam Observables', 'Particle Types', and 'Internal Documentation'. The main content area is a table with columns: 'Acronym', 'Name and Web Site', 'Country', 'Location', and 'Local Administrator'. It lists ten laboratories, including BNL, CELLS-ALBA, CERN, DESY, DIAMOND, ESS, FNAL, GSI, KEK, ORNL, PSI, RIKEN, and SOLEIL. At the bottom of the table is a link to 'Add new item'.

Acronym	Name and Web Site	Country	Location	Local Administrator
BNL	Brookhaven National Laboratory	USA	Brookhaven	Michiko Minty
CELLS-ALBA	ALBA Synchrotron Light Facility	Spain	Barcelona	Francis Perez
CERN	European Laboratory for Nuclear Research	Switzerland	Geneva	Jean-Jacques Gras
DESY	Deutsches Elektronen-Synchrotron	Germany	Hamburg	Kay Wittenburg
DIAMOND	Diamond Light Source - UK's National Synchrotron	UK	Oxfordshire	Guenther Rehm
ESS	European Spallation Source	Sweden	Lund	Andreas Jansson
FNAL	Fermi National Accelerator Laboratory	USA	Chicago	
GSI	GSI Helmholtzzentrum für Schwerionenforschung	Germany	Darmstadt	Marcus Schwickert
KEK	High Energy Accelerator Research Organization	Japan	Tsukuba	
ORNL	Oak Ridge National Laboratory	USA	Oak Ridge	Alexander Aleksandrov
PSI	Paul Scherrer Institute	Switzerland	Villigen	Volker Schlott
RIKEN	RIKEN	Japan	Wako	
SOLEIL	SOLEIL Synchrotron	France	Saclay	

[+ Add new item](#)

This gives the list of the laboratories participating to the effort with their corresponding Local Administrators

The Current Prototype: The Machine Overviews

World Portal for Beam Instrumentation > Machine Overview > All Items

Beam and machine parameters of each laboratory accelerators

Home	Stats	Acronym	DataState	Machine Type	Length-m
BI Portal					
Laboratories					
Machine Overview		CERN_LHC	OnReview	Storage Ring	27,000
Beam Instrumentation					
Instrument Technology		CERN_LINAC2	OnReview	Linear Accelerator	
Documentation					
Related Events		CERN_LINAC3	OnReview	Linear Accelerator	
Discussions					
Discussions		CERN_PS	OnReview	Synchrotron	
People and Groups		CERN_PSB	OnReview	Synchrotron	
Temporary Links		CERN_SPS	OnReview	Synchrotron	
Machine Types		DLS_BR	UpToDate	Synchrotron	158.4
Beam Observables					
Particle Types		DLS_LINAC	UpToDate	Linear Accelerator	12
Internal Documentation					
Temporary Sites		DLS_SR	UpToDate	Synchrotron Light Source	561.6
Recycle Bin					
All Site Content		ESS_LINAC	OnReview	Linear Accelerator	500

Version: 2.0
Created at 22/09/2011 03:07 PM by Guenther Rehm
Last modified at 22/09/2011 03:39 PM by Guenther Rehm

This gives the list of the different machines (with the relevant beam and machine parameters) that are covered. This parameter list has to be finalised but it should allow to find the machine facing the same kind of challenges than ours.

The Current Prototype: The Instruments/Responsible

The screenshot displays a web application interface for beam instrumentation. The top navigation bar includes 'Site Actions', 'Browse', 'List Tools', 'Items', and 'List'. The user 'Jean-Jacques Gras' is logged in. The main content area shows a breadcrumb trail: 'World Portal for Beam Instrumentation > Beam Instrumentation > All Items'. Below this, there are tabs for 'Home' and 'Stats', and a search bar labeled 'Search this site...'. The main table lists instruments with columns for 'Instrument', 'Machine', 'Observable', 'Technology', and 'Contact'. A red circle highlights the 'Observable' column header. A secondary table is visible, showing a detailed view of the 'CERN_LHC Beam Loss Monitors' instrument, with its own 'Observable' column also highlighted by a red circle. The interface includes a sidebar with navigation links and a 'Count= 6' indicator for the main table.

Instrument	Machine	Observable	Technology	Contact
Count= 6				
CERN_LHC Abort Gap Monitor				
CERN_LHC Beam Loss Monitors				
CERN_LHC Beam Position Monitors				
CERN_SPS Ring DCCT				
CERN_SPS Ring and Transfer Line				
CERN_SPS Beam Loss Monitors	CERN_SPS	Losses	Ionization Chamber	Christos Zamantzas
+ Add new item				

Instrument	Machine	Observable	Technology	Contact
Count= 2				
CERN_LHC Beam Loss Monitors	CERN_LHC	Losses	Ionization Chamber	Bernd Dehning
CERN_SPS Beam Loss Monitors	CERN_SPS	Losses	Ionization Chamber	Christos Zamantzas
+ Add new item				

This gives the list of the BI experts in the different machines for the different observables.

The Current Prototype: The Relevant Documentation

The screenshot displays the CERN website interface. On the left is a navigation menu with links like 'Home', 'Stats', 'BI Portal', 'Laboratories', 'Machine Overview', 'Beam Instrument', 'Instrument Techn', 'Documentation' (highlighted), 'Related Events', 'Discussions', 'Discussions', 'People and Gro', and 'Temporary Links'. The main content area shows the CERN logo and the title 'the Large Hadron Collider project'. Below this, it specifies 'LHC Project Document No. LHC-B-ES-0006 rev 1.0', 'CERN Div./Group or Supplier/Contractor Document No. AB/BDI', and 'EDMS Document No. 328147'. The date is '2003-07-09'. The document title is 'Functional Specification' and 'MEASUREMENT OF THE TRANSVERSE BEAM DISTRIBUTION IN THE LHC RINGS'. The abstract states: 'This document discusses the anticipated uses of the 1D transverse beam profiles and...'. On the right, a search bar is visible. Below it, a table lists documents with columns: Document Type, Link, and Context. A red arrow points to the entry for 'Functional Specs' with link 'https://edms.cern.ch/file/328147/1.0/LHC-B-ES-0006-10-00.pdf' and context 'Internal'.

Document Type	Link	Context
Technical Specs, Performance Assessment	http://cdsweb.cern.ch/record/1272172/files/CERN-BE-2010-026.pdf	IPAC2010
Functional Specs	https://edms.cern.ch/file/327557/2/lhc-bpm-es-0004v2.PDF	Internal
Functional Specs	https://edms.cern.ch/file/328147/1.0/LHC-B-ES-0006-10-00.pdf	Internal
Performance Assessment	http://cdsweb.cern.ch/record/1267400/files/CERN-BE-2010-010.pdf	BIW2010

This gives the list of references towards relevant documentation with criteria allowing efficient filtering like:

- Document type (func specs, technical specifications, performance assessment...)
- Observable (intensity, position, beam losses...)
- Context (conf, workshop, internal Note...).

The Current Prototype: Related Event Calendar

The screenshot displays a web application interface for a calendar. On the left is a sidebar with a 'Site Actions' menu and a 'Browse' button. Below these are navigation links: 'Home', 'Stats', a monthly calendar view for November 2011, and a list of categories including 'BI Portal', 'Laboratories', 'Machine Overview', 'Beam Instrumentation', 'Instrument Technology', 'Documentation', 'Related Events' (highlighted), 'Discussions', 'People and Groups', 'Temporary Links', 'Machine Types', 'Beam Observables', 'Particle Types', 'Internal Documentation', and 'Temporary Sites'.

The main content area features a search bar and a calendar grid. The calendar shows dates from Wednesday to Saturday. A red arrow points to a specific event on the 10th of the month, labeled 'Beam Monitoring: Developments and Applications (GSI, Darmstadt)'. A detailed pop-up window is open over this event, titled 'Related Events - Beam Monitoring: Developments and Applications...'. This window contains a 'View' tab and a 'Custom Commands' section with options like 'Version History', 'Alert Me', 'Manage Permissions', 'Delete Item', and 'Manage'. The event details include:

- Title: Beam Monitoring: Developments and Applications
- Location: GSI, Darmstadt
- Start Time: 10/11/2011 12:00 AM
- End Time: 11/11/2011 11:59 PM
- Description: An initiative to bring together the brightest minds in the field from both academia and industry. This workshop serves as a platform to present and discuss current developments and standing issues, to find synergies and common grounds.
- Category: Workshop
- All Day Event: Yes
- Recurrence: (empty)
- Workspace: (empty)
- Observable: Chromaticity; Coupling; Intensity; Longitudinal Distribution; Losses; Position; Time of Flight; Transverse Distribution; Tune
- Instrument Technology: Beam Induced Fluorescence Monitor; Current Transformer for Pulsed Beam; DC Current Transformer; Faraday Cup; Ionization Chamber; Multi Wire Proportional Chamber; Pick-Up (capacitive, inductive); PIN Diode; Residual Gas Profile Monitor (Ionisation); Schottky Monitor; Scintillation Counter; Screen (OTR, Scintillation); Secondary Emission Monitor; Slit-Grid; Sync. Radiation Telescopes; Wall Current Monitor; Wire Scanner
- Details: info link

At the bottom of the pop-up, it states 'Content Type: Event', 'Created at 26/09/2011 04:26 PM by Jean-Jacques Gras', and 'Last modified at 26/09/2011 04:27 PM by Jean-Jacques Gras'. A 'Close' button is located at the bottom right of the pop-up.

This calendar allows tp advertize local events like todays one.

The Current Prototype: The Discussion Forums

The screenshot displays a SharePoint site interface. At the top, the 'List Tools' tab is active, showing options like 'Standard View', 'Datasheet View', 'New Row', 'Create View', 'Create Column', 'Navigate Up', and 'Manage Views'. The 'Alert Me' icon, represented by a bell, is circled in red. Below the navigation bar, the left sidebar contains a list of site sections: 'BI Portal', 'Laboratories', 'Machine Overview', 'Beam Instrumentation', 'Instrument Technology', 'Documentation', 'Related Events', 'Discussions', 'People and Groups', 'Temporary Links', 'Machine Types', 'Beam Observables', 'Particle Types', 'Internal Documentation', and 'Temporary Sites'. The 'Discussions' section is highlighted. The main content area shows a list of discussion topics, including 'Another subject on DCCT in storage rings', 'Dummy subject for test purpose', 'Negative Comments on this Sharepoint Site Functionality', 'Comments on the List of Machine Overview', 'Comments on the List for Beam Instrumentation', 'Positive Comments on this Sharepoint Site Functionality', 'Discussion on Steering Committee', 'Discussion on Access Rights to this Site', 'Discussion on Data Update Frequency', 'Discussion on Laboratory Linkperson Role', 'Comments on the List for Documentation', 'Comments on the List of Machine Types', 'Comments on the List of Laboratories', 'Comments on the List of Particle Types', 'Comments on the List of Instrument Technologies', and 'Comments on the List of Beam Observables'. A red arrow points from the 'Alert Me' icon to the 'World Portal for Beam Instrumentation - Discussions' section. The right sidebar shows the 'World Portal for Beam Instrumentation - Discussions' section, which includes a 'Connect to this Discussion Board' link, a 'Preview this Discussion Board' link, and a list of discussion topics. The 'Alert Me' icon is circled in red, and a red arrow points from it to the 'World Portal for Beam Instrumentation - Discussions' section.

This page allows Users to launch discussion forums. One goody from Sharepoint is its ability to configure *Alerts*. It is straightforward to configure the system to send me an email every morning at 8:00 with a summary of all the new entries in the forum...

The Role of the Local Admin (the Price to Pay)

- The Local Administrator plays obviously a key role in this project
- He/She will be in charge of the validity of :
 - the machine overview and beam instrumentation data concerning her/his lab.
 - the list of instruments and responsible in his/her lab
 - the collection of the relevant documents produced in his lab (major conf contributions, major internal notes)
- He/She will also be responsible for announcing the local events and discussing/proposing the future structural upgrades/modifications of the site.

The Role of the Local Admin (the Price to Pay)

- This might look heavy at first glance but it is certainly not so bad and probably worth the effort
- Gathering and entering the initial set of data could be a non negligible (but always useful) effort
- But maintenance effort afterwards should be pretty limited. Even a simple synchronized yearly update could probably be enough
- All the rest is done by the Users with direct interest in the return
- **It looks to be a good investment with respect to the potential return of the tool for our community**

Conclusions

- The prototype of this BI web portal proposes most of the features we wanted for our first step
- It is now up to us to
 - Finalize the parameters of the different lists
 - Populate these lists with data and make it grow
 - to have a feeling of the viability of the project and its current implementation
 - and have something concrete and solid to propose during the first IBICS
- Hoping you're interested, I'm longing for your feedback.

Questions ?
Comments ?
Enthusiastic Volunteers ?