

WP15.5 - IRRAD Data Manager & Irradiation Facilities / Test-beams database (D15.6)

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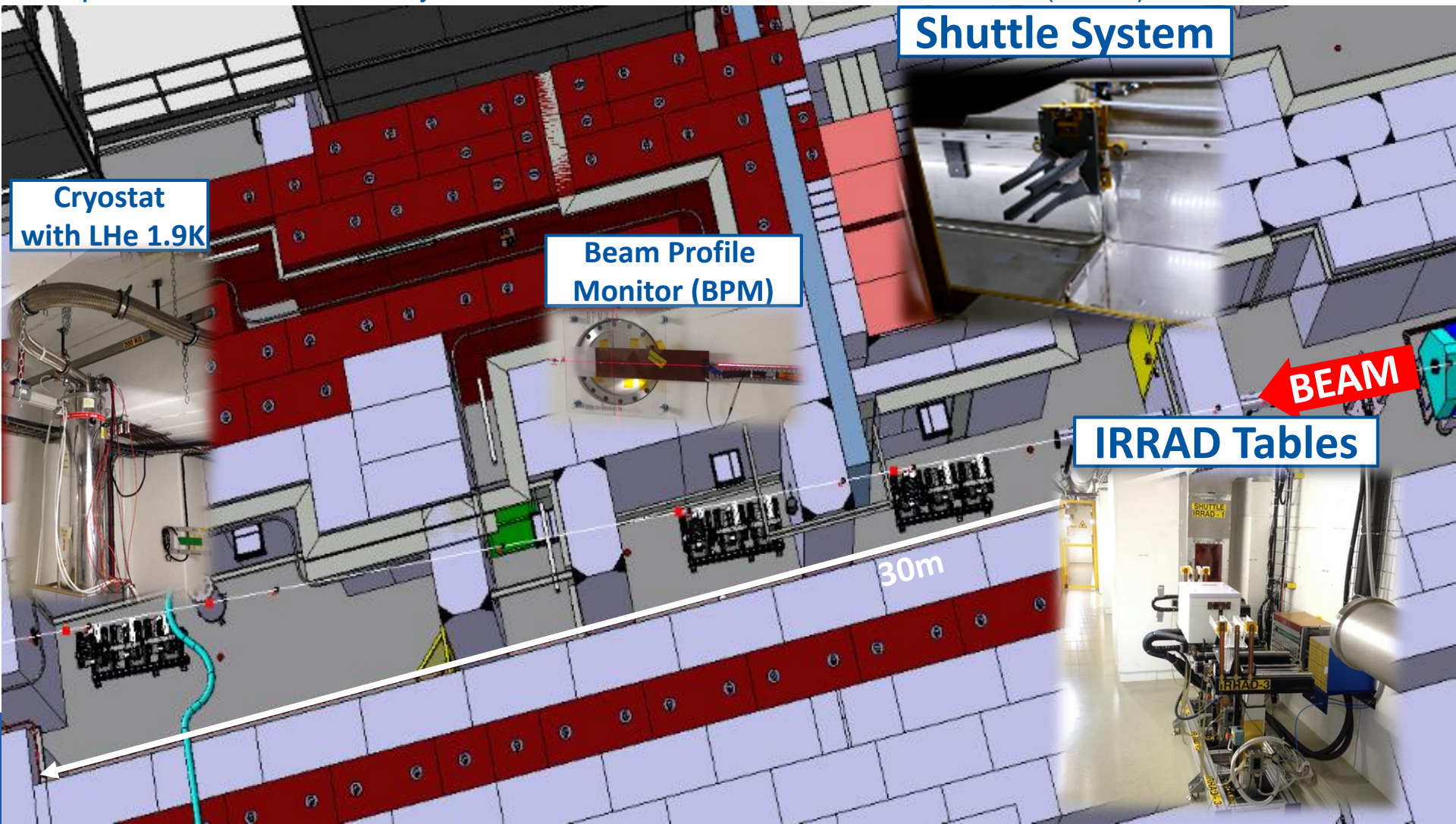


Outline

- **IRRAD Facility & Summary Proton Run 2018**
- **New IRRAD website**
- **IRRAD Data Manager & PhD Thesis**
- **Irradiation Facilities Database**
- **Test Beam Facilities Database Progress**

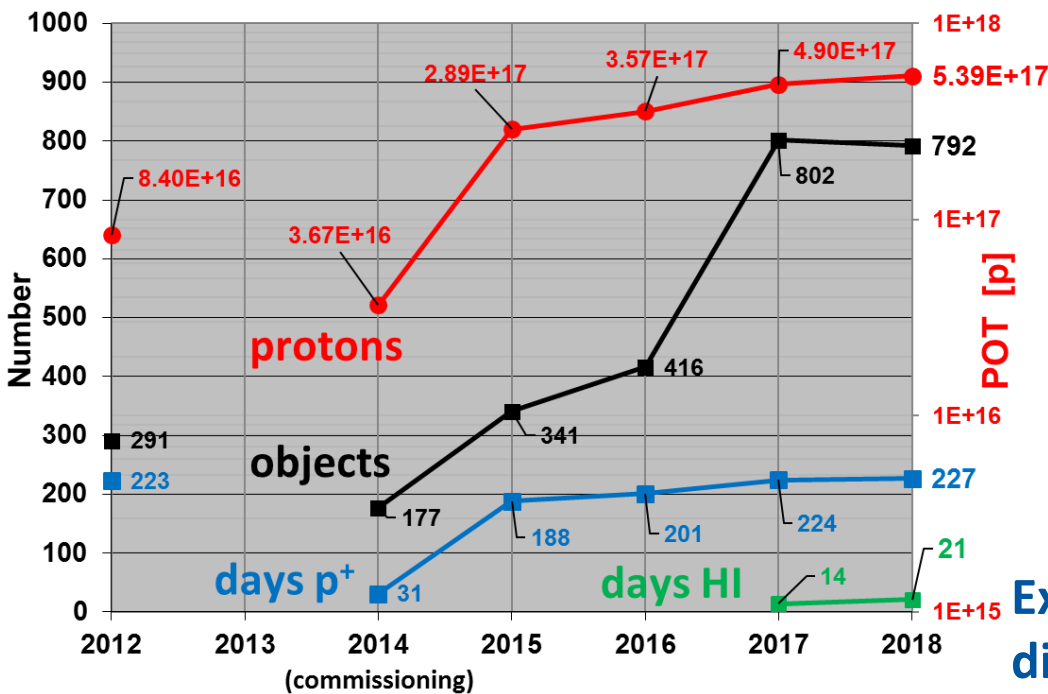
Proton Irradiation Facility IRRAD

- Testing inner detector components of the HEP experiments
- Beam of 24 GeV/c and size of 12×12 mm²
- Spills of ~400 msec every ~10 sec
- Fluence of 1×10¹⁶ p/cm² in 14 days
- Scanning up to dimensions of 10×10cm²
- Cryostat with LHe 1.9K
- Low T irradiations (-25°C)

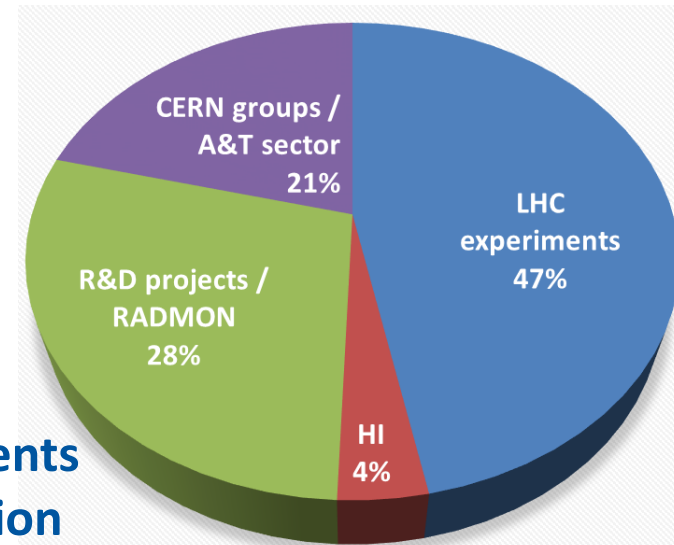


IRRAD: Summary Run 2018

- 81 experiments completed in 2018:
 - 92 users registered in the IRRAD Data Manager (cern.ch/irrad-data-manager)
 - 996 objects declared by the users
 - 792 objects irradiated



Experiments distribution



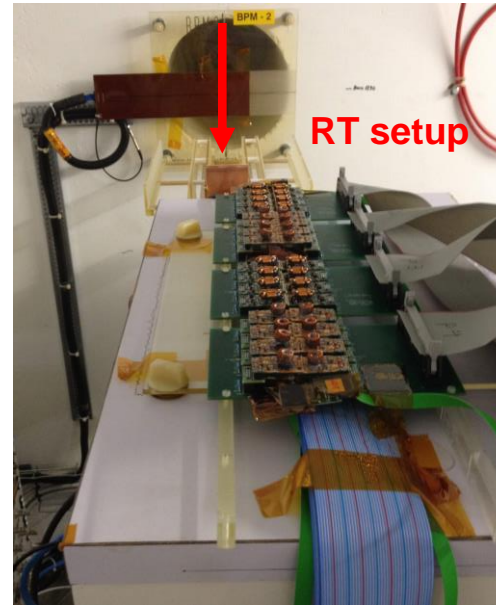
IRRAD: Summary Run 2018



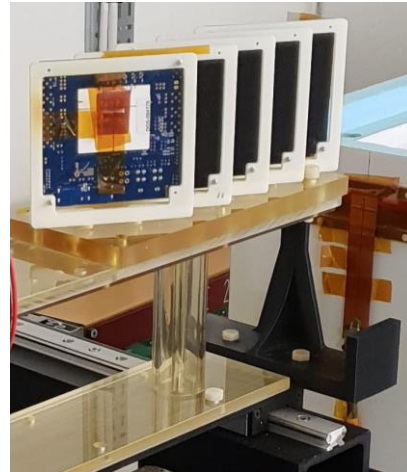
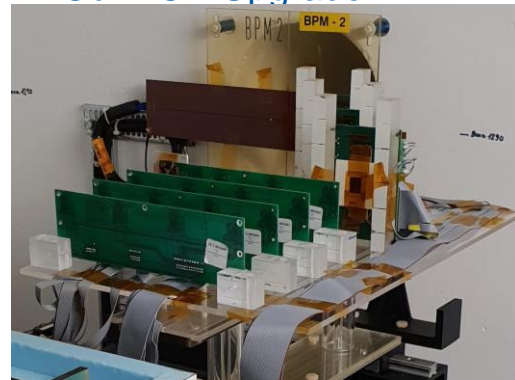
Piezo actuators
for Crystal Collimation, Vacuum, Cryogenics, etc. (EN,TE)

RD53A modules
for ATLAS ITk

2x **FEAST2 DC/DC converters test**
in cold-box & RT with “thin” 10mm Cu target (EP-ESE)

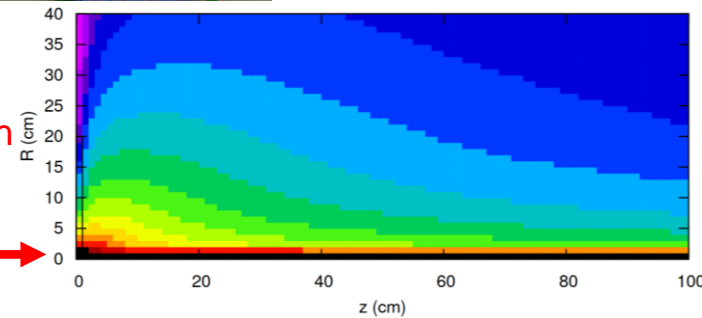


CLARO ASIC for the LHCb RICH Upgrade



IRRAD 10mm Cu Target

1MeV eq. Φ simulation with Cu-target



IRRAD: New IRRAD Website

K. Gurbanli

- New and clever website taking into account users feedback
- User friendly and intuitive following the User Experience principles

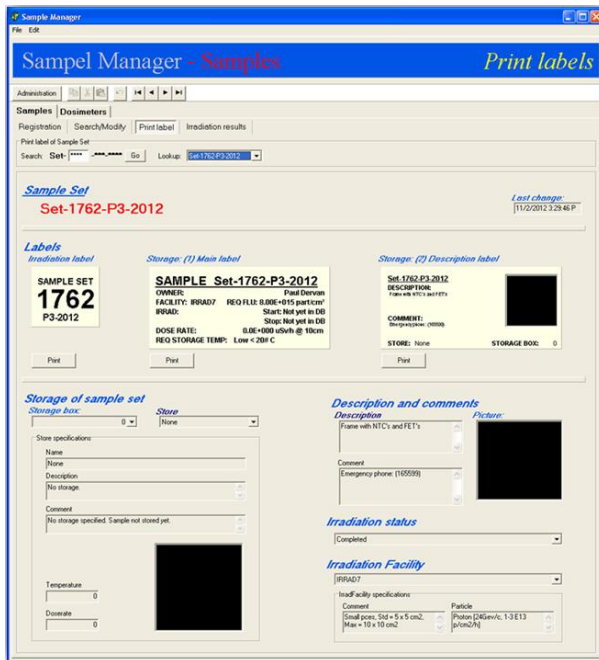
cern.ch/ps-irrad

The screenshot displays the IRRAD website interface. At the top, there is a navigation menu and the IRRAD Proton Facility logo. The main header features the title "PS-IRRAD Proton Facility" and "Latest news" with three news items: "Registrations for the proton run 2018 are now closed!", "AIDA-2020 Transnational Access", and "Irradiation runs 2019-2020". Below this, the website is organized into several content blocks:

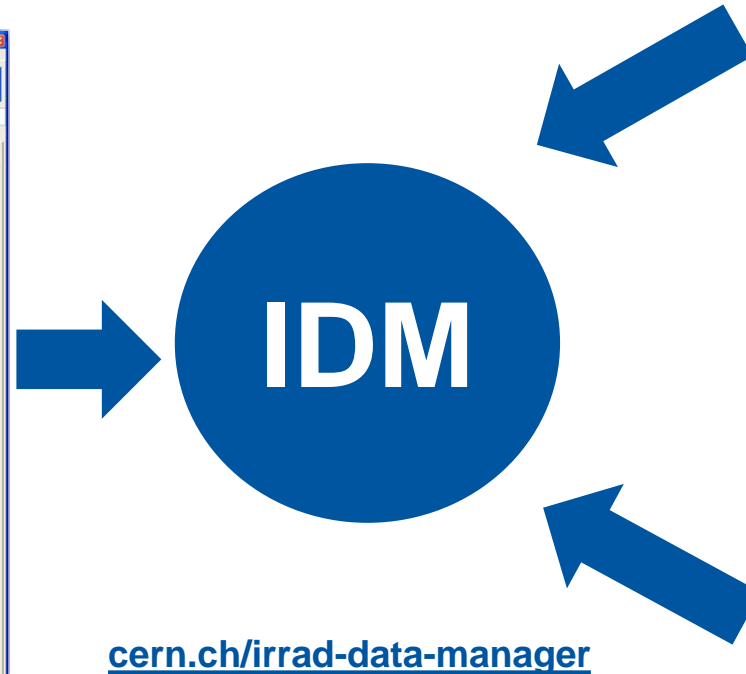
- Registration:** A section with a plus icon containing text about the end of the 2018 proton run and a "Register" button.
- Facility description:** A section with a grid icon containing a floor plan diagram and a photograph of the facility. It includes text about the location on the T8 beam-line and instructions for irradiating samples.
- Beam parameters:** A section with a gear icon containing a list of parameters and a graph titled "IRRAD Beam Parameters".
- Contacts:** A section with a list icon containing contact information for Federico Ravotti, Giuseppe Pezzullo, and CCC PS.
- Access and safety:** A section with a warning icon containing text about ADAms permissions and safety requirements.
- Dosimetry results:** A section with a checkmark icon containing links to check the latest results and an archive.
- Useful apps:** A section with a grid icon containing links to "Beam Profile Monitor", "Data Manager", and "OP Webtools".

At the bottom of the page, there are four columns of links: "T8 Beam Operation", "EP-DT Group", "Other useful links", and "E-group".

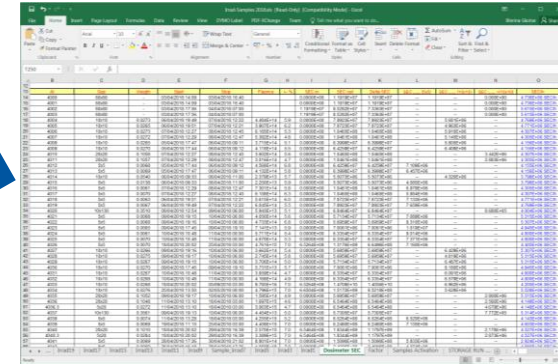
IRRAD Data Manager (IDM)



Traceability
(Before)



cern.ch/irrad-data-manager



Facility Operation
(During)



Dosimetry Results & Archive
(After)

IDM: Key Features Summary

Before

- Experiments, samples, users and dosimeters registration
- Label printing

Old
Sample
Manager

During

- Real-time follow-up of irradiation experiments
- Computation of proton interaction parameters

After

- Display and archive of dosimetry result (~600 spectrometry measurements/year)

Extra

- User Interface preferences customization
- History and details of past experiments (with user permission)
- **Can be used also for irradiations in other facilities (PSI)**

New
IDM

IDM: Irradiation Experiments View

Before

CERN Accelerating science Signed in as: blerina.gkotse@cern.ch Sign out Directory

HOME EXPERIMENTS BPM IRRAD INFO PREFERENCES

IRRAD Data Manager

Welcome to IRRAD Data Manager, the all-in-one data management tool for IRRAD

My Experiments

IRRAD Data Manager

HOME EXPERIMENTS BPM IRRAD INFO PREFERENCES

IRRADIATION EXPERIMENTS

Search... [New Experiment]

Last update	Irradiation title	Availability	No. samples	No. users	Status	Actions
11/01/2019	Irradiation Test 2	05/11/2018	1	0	Validated	[Edit] [Users] [Samples] [More]
11/01/2019	Irradiation Test 1	05/11/2018	1	0	Validated	[Edit] [Users] [Samples] [More]

IDM: Samples View

Before

The screenshot displays the IRRAD Data Manager interface. The top navigation bar includes 'HOME EXPERIMENTS BPM IRRAD INFO PREFERENCES' and logos for CERN, IRRAD, and AIDA 2020. The main content area is titled 'IRRAD Data Manager' and features a table of samples. A modal window is open, showing 'Sample details' with a diagram of a sample stack and input fields for 'Total height (mm)' and 'Total width (mm)'. Below this is a table of layers with columns for Name, Length (mm), Element/Compound, and Delete.

Last update	Sample ID	Sample Name	Category
11/01/2019	Not assigned	Sample NA2	Passive standard 10x10
10/01/2019	Not assigned	Sample NA1	Passive standard 10x10



Name *	Length (mm) *	Element/Compound	Delete
L1	0.13	kapton	x
L2	0.0006	Al(13)	x
L3	0.0006	SiO2	x
e.g. L1		-----	x

cern.ch/irrad-data-manager

IDM: Irradiation Status View

During

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HOME EXPERIMENTS BPM IRRAD INFO ADMIN PREFERENCES  IRRAD Proton Facility 

IRRAD Data Manager

Irradiation Status

[← Back](#) [+ New Irradiation](#) Select a table

Updated at	Sample	Dosimeter	Date IN - Date OUT	IRRAD table	Table position	Accumulated fluence	SEC	Updated by	Status	In Beam	Actions
15/11/2018	SET-003899	DOS-004211	15/11/2018 16:11 -	IRRAD19	Center		272851	irradiation.facilities@cern.ch	Registered	<input type="checkbox"/>	Edit Status Delete
15/11/2018	SET-003900	DOS-004211	15/11/2018 16:11 -	IRRAD19	Center		272851	irradiation.facilities@cern.ch	Registered	<input type="checkbox"/>	Edit Status Delete
15/11/2018	SET-003901	DOS-004211	15/11/2018 16:11 -	IRRAD19	Center		272851	irradiation.facilities@cern.ch	Registered	<input type="checkbox"/>	Edit Status Delete
15/11/2018	SET-003902	DOS-004211	15/11/2018 16:11 -	IRRAD19	Center		272851	irradiation.facilities@cern.ch	Registered	<input type="checkbox"/>	Edit Status Delete
15/11/2018	SET-003903	DOS-004211	15/11/2018 16:11 -	IRRAD19	Center		272851	irradiation.facilities@cern.ch	Registered	<input type="checkbox"/>	Edit Status Delete

IDM: Dosimetry Results View

After

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Sign out Directory

HOME EXPERIMENTS BPM IRRAD INFO ADMIN PREFERENCES

Mat

< Back

Your experiment

	Last update	ID	Name	Category
<input type="checkbox"/>	07/08/2018	SET-003252	ULTEM1000	Passive standard
<input type="checkbox"/>	13/08/2018	SET-003253	PEEK	Passive standard
<input type="checkbox"/>	07/08/2018	SET-003254	Carbon Fiber	Passive standard
<input type="checkbox"/>	07/08/2018	SET-003255	Aluminum Lid	Passive standard

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HOME EXPERIMENTS BPM IRRAD INFO ADMIN PREFERENCES

IRRAD Proton Facility AIDA²⁰²⁰

IRRAD Data Manager

Dosimetry results for SET-003252 (ULTEM1000)

< Back

Search...

Export

Dosimeter	Dimensions (mm ²)	Date In	Date Out	SEC	Accumulated fluence	Error(%)	Comments
DOS-004033	10×10	18/04/2018 20:02	05/09/2018 03:00	1.41e+10	9.79e+16	7	
DOS-004151	10×10	12/09/2018 13:25		0.00e+00		None	

Dosimeter dimensions (mm ²)	Total accumulated fluence
10×10 mm ²	9.790e+16 Protons/cm ²

cern.ch/irrad-data-manager

IDM: Experiments History View

After

The image displays three overlapping screenshots of the CERN IDM Experiments History View. The top screenshot shows the main experiment list. The middle screenshot shows the 'Experiment Details' for '3D pixel for ATLAS ITk', including fields for Title, Description, CERN experiment/Projects, Responsible person, Irradiation type, and Additional comments. The bottom screenshot shows a modal window titled 'Update Comment' with a text area for adding links to publications and 'Cancel' and 'Submit' buttons.

cern.ch/irrad-data-manager

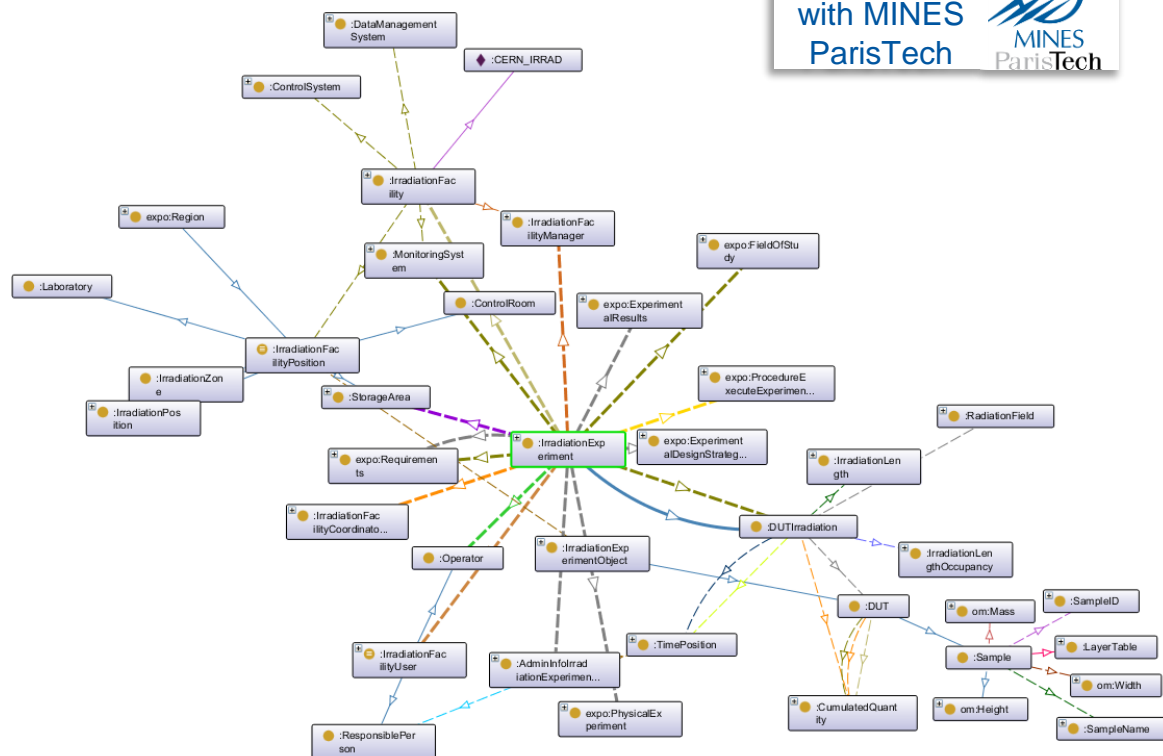
Ontology for Irradiation Experiment Data Management

PhD Thesis
with MINES
ParisTech



- **Purpose:** Formalisation of knowledge gained from IDM and application to other irradiation facilities

- **Irradiation experiment model** (ontology) that contains key entities and relations for the data management of irradiation experiments (IEDM*)



Ontology for Irradiation Experiment Data Management (IEDM)

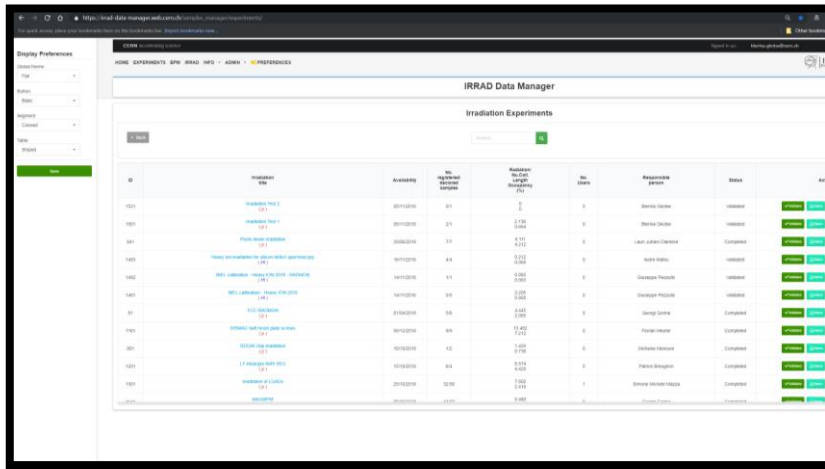
*Abstract and paper submitted to the European Web Semantics Conference 2019 (ESWC <https://2019.eswc-conferences.org/>)

Graphical User Interface Generation & Customisation

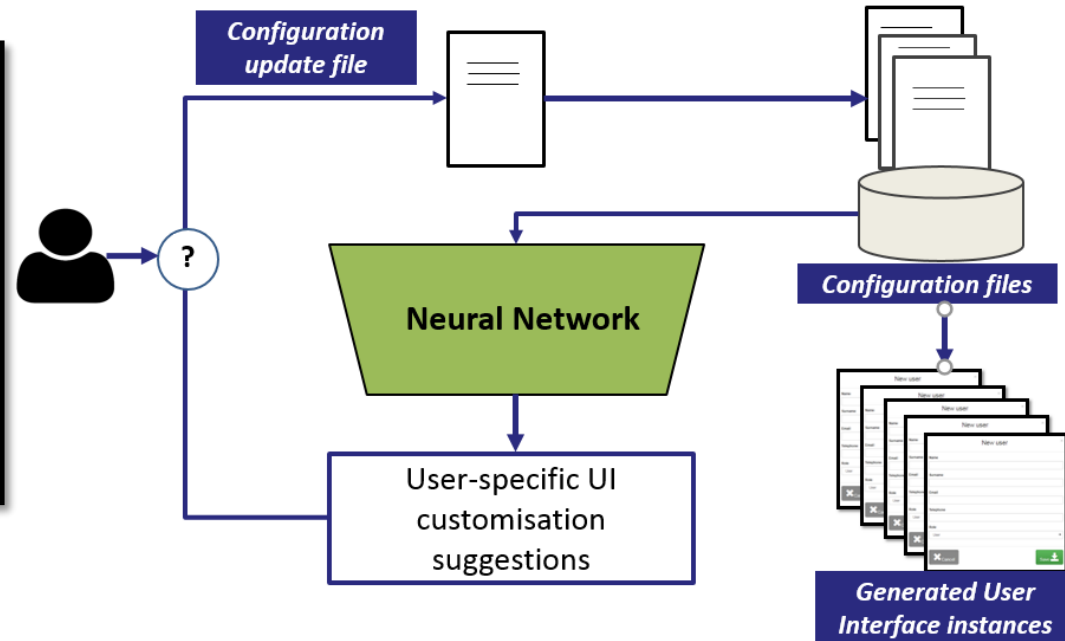
PhD Thesis
with MINES
ParisTech



- Association and extension of IEDM with User Interface (UI) entities
- Use IEDM as a base for UI automatic generation
- Machine learning techniques (collaborative filtering and classification) for UI preferences recommendation and customisation



IDM UI preferences manually customised



Workflow for UI preferences recommendation

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- **Irradiation Facilities Database**
- **Test Beam Facilities Database Progress**

Irradiation Facilities Database

An online platform for finding a suitable facility for your irradiation experiments*, very important during LS2!

- **211** irradiation facilities
- **2900** visits since first launched (February 2017)
- **~40%** of irradiation facilities validated
- Plan to send new reminder

cern.ch/irradiation-facilities

The screenshot shows the 'Facilities Database' page. It includes a search interface with three dropdown menus: 'Search by Country' (set to 'All'), 'Search by Source Type' (set to 'All'), and 'Search by Radiation Field Type' (set to 'All'). There are buttons for 'Show Data' and 'Log in to Edit Data'. Below the search bar is a table with the following columns: Details, Institute Name, Country, Facility Name, Source Type, Radiation Field Type, and Funding Details. The table lists several facilities, including ESTEC Co-60 Facility, CERN LHCs/SuF1 X-ray facility, LPSC GENESPI, Institut Laue-Langevin (ILL) D50, CERN HRadMat, Institut für Experimentelle Kernphysik KAZ, University of Ljubljana Reactor Centre, University of Birmingham UeB IAC40, Jozef Stefan Institute Reactor Centre, DESY II, CERN CERN Proton Irradiation Facility (IPAC), and CERN GEL+.

*AIDA-2020 Newsletter *On track* article "One list to find them all"



COUNTRY	VISITS
Switzerland	1,307
France	308
United States	231
Italy	159
Germany	106
United Kingdom	93
Finland	60
Spain	50

Test Beam Facilities Database

An initiative pushed by the BTTB community within the AIDA-2020 extension.

Progress so far:

- Domain name: cern.ch/test-beam-facilities
- A first list of test beam facilities provided by C. Rembser
- Responsible person: Henric Wilkens (CERN), Jan Dreyling-Eschweiler (DESY), or...?
- Requirements and characteristics need to be discussed and finalised**

Test beams* in the world, status September 2017						
Laboratory	Number of beam lines	Particles	Energy range	Diagnostics etc.	Availability	Information, contacts & comments
CERN / PS (CH)	2	e, h, μ (sec.)	0.5 - 10 GeV/c	Threshold Cherenkov, scintillators, MWPCs, delay wire chambers, scintillators, magnet, movable platform	9 months per year, continuous except winter shutdowns	Contact beam time request and scheduling: Sps.Coordinator@cern.ch
CERN / PS (CH)	2	e, h, μ (sec.)	0.5 - 10 GeV/c	Threshold Cherenkov, scintillators, MWPCs, delay wire chambers, scintillators, magnet, movable platform	9 months per year, continuous except winter shutdown	Contact beam time request and scheduling: Sps.Coordinator@cern.ch
CERN / SPS (CH)	4	p (prim.) e, h, μ (sec.) e, h (tert.) Pb ions (prim.) other ion species (out of fragmented primary Pb ions)	400 GeV/c 10 - <400 GeV/c 10 - 200 GeV/c 20 - 400 GeV/c proton equivalent (z=1)	Delay wire chambers, filament scanners, XEMC calorimeters, Threshold & CEDAR, hodoscopes, magnet, movable platform	Duty cycle depends on PS / SPS / LHC operation mode and is typical * PS -1-3% * SPS: 20-40%	Contact beam lines: sba-physicists@cern.ch http://sba.web.cern.ch/sba/
CERN / CLEAR (CH)	1	e-	50-250 MeV/c		No PS and SPS test beams in 2019 and 2020 8-9 months per year	Contact: CLEAR-Info@cern.ch https://clear.web.cern.ch
(typical rate: 2kHz)						
FERMILAB/PTBF (US)	2	p (prim.) e, h, μ (sec.) h (tert.)	120 GeV/c 1-6 GeV/c 200-500 MeV/c	Cherenkov, TOF, p-glass calorimeters, MWPC, Si Tracker, see website for more	24 hrs/day 6% duty cycle	Contact: FTB_Co@fnal.gov http://fnal.gov more contacts: Mandy.Rominsky@fnal.gov Erik.Ramberg@fnal.gov
IHEP Beijing (CN)	2	e (prim.) e (sec.) p, n (sec.)	1.1 - 2.5 GeV/c 1-6 GeV/c 0.4 - 1.2 GeV/c	MWPC, TOF Cherenkov, CAMAC system, platform	Availability: 3 months per year, duty cycle depends on BEPCII operation mode	Contact: Hu Tao (htao@ihep.ac.cn)
IHEP Protvino (RU)	5	p (prim.) p, K, π , μ , e (sec.) C-12 (prim.)	70 GeV/c 1-45 GeV/c 6-300 GeV/c	Cherenkov, TOF, MWPC	two months per year duty cycle (U-70 machine): 15-30%	contact: Alexandre Zaitsev (alexandre.zaitsev@cern.ch)
KEK / JPARC (JP)						No dedicated lines for test beams contact: Masaharu Tani (masaharu.tani@kek.jp) http://j-parc.jp/researcher/Hadron/en/index.html
KEK / Tsukuba (JP)						Fuji beam line in KEKB main ring unavailable until Super KEKB will resume operation http://www.kek.jp/facility/SPNS/K11/BeamLine/
PSI / pE1, pM1, etc. (CH)	2-4	π^+ , π^- , e^+ , e^- , p	50-450 MeV/c, rate $<10^8$ sec ⁻¹ 20mac structure continuous beam at very high rate		6-8 months per year	Beam time allocated by programme committee (twice per year) Contact: David Reggiani (david.reggiani@psi.ch)
PSI / PIF (CH)	1	p	5-230 MeV/c max. current 2-3 nA, rate $<10^7$ sec ⁻¹ , typ. rate 10^6 sec ⁻¹ for wide beam, energy, beam spot and flux selectable by user		11 months per year, mostly during weekends	Contact: Wojtek Hajdas (wojtek.hajdas@psi.ch)
SLAC (US)	1	e (prim.) e (sec.)	2.5 - 15 GeV/c 1 - 14 GeV/c		9 months per year, 50% duty cycle	Contact: Carsten Hast (hast@slac.stanford.edu) http://slacoperational.slac.stanford.edu/beamtest_public/csf/
SPRING-8, Compton Facility (JP)	1	photons (tagged) e ⁺ , e ⁻ (conv.)	1.5 - 3.0 GeV/c 0.4 - 3.0 GeV/c		>60 days per year	Contact: Takashi Nakano (nakano@spring8.or.jp) http://www.spring8.or.jp/en/
University of Bonn ELSA (D)	1	e-	Energy range: 1.2 - 3.2 GeV/c rate \sim 1 kHz - 1 GHz	Trigger, beam telescope	upon request, \sim 30 days/year	Contact: Daniel Eltner (eltner@physik.uni-bonn.de) http://www-elsa.physik.uni-bonn.de/elsa-facility_en.html
University of Mainz MAMI (D)	2	e- gamma	Energy range for e- and gamma beam: $<$ 1.6 GeV/c e- intensity $<$ 100nA	energy tagged photon beam	upon request, \sim 30 days/year	Contact: Susanne Fischer Fischer (kph.uni-mainz.de) http://www.kph.uni-mainz.de/eng/index.php

*beam lines with beams of energies higher than 100 MeV/c

08. Sept 2017

Test Beam Facilities Database Modifications Proposal

Facility Coordinator Contact Information
Name
E-mail
Alternative e-mail
Phone

Institute/Organization Details
Name
Address
City
Country
Website

Facility Data
Name
Source
Radiation Field → Particle type
Energy Range
Activity
Power → Number of beamlines
Min Dose Rate
Max Dose Rate
Min Flux → Beam Current
Max Flux → Flux Range
Pulsed or Continuous
Repetition Time Rate

Additional Comments
Comments

Test Beam Conditions
Is an active readout of the sample possible during irradiation?
Is there any sample dosimetry → beam diagnostics available?
Will the sample be considered radioactive after testing?
Can the humidity be controlled during testing?
Can the temperature be controlled after testing?
Is there any sample position system?
Min Temperature
Max Temperature
Dosimetry Type
Irradiation Volume
Irradiation → Test Beam
Comments

Safety
Is a medical Certificate required?
Mandatory CERN RP Training certificate?
Is a CERN Radiation Passport needed?
Should you bring your own dosimeter?
Does the facility hold a Licence for import/export of radioactive material with CERN?
Safety comments

Accessibility
Special Agreement with CERN
Agreement Details
Special Funding Programs
Funding Details
Availability