

RD 51 Collaboration News

Leszek Ropelewski (CERN), Maxim Titov (CEA Saclay)



MPGD2011 and 8th RD51 Collaboration Meeting
29 August - 3 September 2011
Kobe, Japan



6th RD51 Collaboration Meeting
October 7-10 2010
Bari, Italy

84 RD51 Member Institutes; ~ 450 Participants



5th RD51 Collaboration Meeting
May 24 - 27 2010
Freiburg, Germany



MPGD2009 and RD51 Collaboration Meeting
June 14 - 17 2009
Orthodox Academy of Crete, Kolympari

RD51 Collaboration Mini-Week, CERN Geneva, April 22, 2013

RD51 Collaboration Mini-Week (CERN, April 22 – April 24, 2013):
<https://indico.cern.ch/conferenceOtherViews.py?view=standard&confId=245535>

Monday April 22 (Auditorium 40-5-A01)

09:00 – 10:00 RD51 Collaboration News

10:00 - 12:00 WG4 Software

14:00 - 18:00 WG2 Physics Issues

18:00 – 19:00 WG7 Test Beams (Auditorium 40-S2-C01)

Tuesday, April 23

09:00 – 12:30 WG5 Electronics (Auditorium 40-5-A01)

14:00 – 17:00 WG1 MPGD Technologies and New Structures (Aud. 216-R-401)

Wednesday, April 24 (40-S2-A01)

09:00 – 13:00 WG4 Software

14:00 - 17:00 WG6 Production

RD51 Collaboration Meetings in 2013 and Communications:

- **30 January – 1 February: RD51 Mini-Week (CERN)**
- **22 – 24 April: RD51 Mini-Week (CERN)**
- **5 - 6 July: RD51 Collaboration Meeting (Saragoza, Spain) – together with MPGD 2013 (1-4 July)**
- **14 – 16 October: RD51 Collaboration Meeting (CERN)**

RD51 Official Communications:

- **RD51 Collaboration Meetings Agenda:**
<http://rd51-public.web.cern.ch/RD51-Public/Meetings/CollaborationMeetings.html>
- **CB minutes:**
<https://espace.cern.ch/test-RD51/CB%20meeting%20minutes/Forms/AllItems.aspx>
- **MB minutes:**
<https://espace.cern.ch/test-RD51/MB%20meetings/Forms/AllItems.aspx>

2013 MPGD Conference and RD51 Collaboration Meeting in Zaragoza

3rd International Conference on Micro Pattern Gaseous Detectors

MPGD2013

01-04 July 2013 - Zaragoza (Spain)
RD-51 Collaboration Meeting on July 5-6

Topics in:

- New developments in MPGDs
- Production techniques
- Performance tests
- MPGD detector physics
- Simulation and software
- Electronics
- Applications

Advisory Committee

- + T. Bohm (DESY)
- + R. Bellazzini (INFN Pisa)
- + A. Broekhin (Waltzmann Institute)
- + P. Colas (CEA Saclay)
- + G. Fanourakis (NCSR Demokritos)
- + S. Delle Torre (INFN Trieste)
- + H. van der Geest (NIKHEF)
- + J. Hebe (KEK)
- + J. Jares (SLAC)
- + T. Matsuuda (KEK)
- + W. Riegler (CERN)
- + L. Ropelewski (CERN)
- + F. Sauli (TERA Foundation)
- + T. Tanimori (Kyoto Univ.)
- + M. Titov (CEA Saclay)

International Organizing Committee

- + A. Cardini (INFN Cagliari)
- + K. Boser (G. Bonn)
- + Th. Goralis (NCSR Demokritos)
- + I. Giomantis (CEA Saclay)
- + T. Kawamoto (ICIPP Tokyo)
- + A. Oishi (Kobe Univ.)
- + Y. Poljanski (BNL)
- + S. Sharma (CERN)
- + A. White (Texas Arlington)
- + J. Wotawa (CERN)

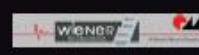
Local Organizing Committee

- + Igor G. Iliastorza (U. Zaragoza) (Chair)
- + J. A. Villar (U. Zaragoza)
- + G. Luain (U. Zaragoza)
- + S. Corbelli (U. Zaragoza)
- + Th. Darini (U. Zaragoza)
- + D. González-Díaz (U. Zaragoza)

Technical Support

- + A. Ortiz de Solórzano
- + F. J. Mora

Sponsored by



More information: <http://gifna.unizar.es/mpgd13> or mpgd2013@gmail.com

<http://gifna.unizar.es/mpgd13>

- ❖ 73 abstracts received by April 20
- ❖ **Abstract submission deadline is extended until Friday, April 26**
- ❖ Deadline for Early Registration → May 20
- ❖ Abstracts (not accepted as orals for 2013 MPGD) can be presented in the RD51 Collab. Meet. (July 5-6);
- ❖ All submissions presented in the RD51 Collab. Meeting in Zaragoza will be eligible for the 2013 MPGD Conference Proceedings (JINST)

RD51 Collaboration Notes

<https://espace.cern.ch/test-RD51/RD51%20internal%20notes/Forms/AllItems.aspx>

RD51 INTERNAL NOTES

2011

RD51-Note-2011-017 – "Transport properties of operational gas mixtures used at LHC" (by Y. Assran, A. Sharma)

RD51-Note-2011-016 – "THGEM-based detectors for sampling elements in DHCAL: laboratory and beam evaluation" (by L. Arazi, H. Natal da Luz, D. Freytag, M. Pitt, C. D. R. Azevedo, A. Rubin, M. Cortesi, D. S. Covita, C. A. B. Oliveira, E. Oliveri, R. Herbst, S. Park, J. Yu, R. Chechik, J. M. F. dos Santos, M. Breidenbach, G. Haller, A. White, J. F. C. A. Veloso, A. Breskin)

RD51-Note-2011-015 – "Detection and removal of short circuits from GEM foils" (by M. Kallikowski, T. Hildén, R. Lauhakangas, P. Karppinen, T. Karppinen, R. Turpeinen, F. Garcia, J. Heino and E. Tuominen)

RD51-Note-2011-014 – "Optical Scanning System for Quality Control of GEM foils" (by M. Kallikowski, T. Hilden, F. Garcia, J. Heino, R. Lauhakangas, E. Tuominen and R. Turpeinen)

RD51-Note-2011-013 – "Test beam results of the GE1 upgrade of the CMS high-eta muon system" (by D. Abbar Armagnaud, P. Aspell, Y. Ban, S. Bally, L. Benussi, U. Bunkowski, J. Cai, J. P. Chatelain, J. Christiansen, S. Colafranceschi, E. David, G. de Robertis, R. De Oliveira, S. Duarte Franconi, K. Gnanvo, A. Gutierrez, M. Hohlmann, P. E. Ka Maggi, A. Marchioro, A. Marinov, K. Mehta, J. Merlin, A. Nemallapudi, S. Nuzzo, E. Oliveri, D. Piccolo, H. Postema Ropelewski, G. Saviano, A. Sharma, M. J. Staib, H. Teng, Turini, N. Smilkovic, M. Villa, N. Zaganidis, M. Zientek)

RD51-Note-2011-012 – "Construction and Performance Prototypes for Future Upgrades of the CMS Forward Muon" (by D. Abbar Armagnaud, P. Aspell, Y. Ban, J. Cai, H. Teng, A. Mohapatra, S. Nuzzo, S. Bianco, S. Colafranceschi, D. Piccolo, G. Raffone, G. Saviano, H. Postema, D. Abbaneo, C. Armagnaud, P. Aspell, Bunkowski, J. P. Chatelain, J. Christiansen, A. Conde Gar Duarte Pinto, S. Ferry, F. Formenti, L. Franconi, A. March Nemallapudi, H. Postema, A. Rodrigues, L. Ropelewski, A. Sharma, N. Smilkovic, M. Villa, M. Zientek, A. Gutierrez, P. E. Karchin, K. Gnanvo, M. Hohlmann, M. J. Staib)

RD51-Note-2011-011 – "A Slow Control System for RD51 Test Facilities", (by K. Karakostas, T. Alexopoulos, G. Tsipolitis)

RD51-Note-2011-010 – "Signal propagation and spark mitigation in resistive strips read-outs" (by J. Galan)

RD51-Note-2011-009 – "Innovative designs of resistive microstrip gaseous detectors (R-MSGCs)" (by P. Martinengo, E. Nappi, R. Oliveira, V. Peskov, P. Pietropaolo, P. Picchi)

RD51-Note-2011-008 – "An improved design of spark-protected microstrip gas counters (R-MSGC)" (by R. Oliveira, V. Peskov, F. Pietropaolo, P. Picchi)

RD51-Note-2011-007 – "First observation of Cherenkov rings with a large area CsI-TGEM-based RICH prototype" (by V. Peskov, G. Bencze, A. Di Mauro, P. Martinengo, D. Mayani, L. Molnar, E. Nappi, G. Paic, N. Smirnov, H. Anand, I. Shukla)

RD51-Note-2011-006 – "On the low-temperature performances of THGEM and THGEM/G-APD multipliers in gaseous and twophase Xe" (by A. Bondar, A. Buzulutskov, A. Grebenuk, E. Shemyakina, A. Sokolov, D. Akimov, I. Alexandrov and A. Breskin)

RD51-Note-2011-005 – "Modelling of avalanches and streamers by finite elements with COMSOL: step-by-step guide", Notes for the RD51 Simulation School, CERN, Jan. 19-21 2011, (by P. Fonte)

RD51-Note-2011-004 – "Thermal Stretching of Large-Area GEM Foils Using an Infrared Heating Method" (by Michael Staib, Bryant Benson, Kondo Gnanvo, Marcus Hohlmann, Amilkar Quintero)

RD51-Note-2011-003 – "On the operation of a Micropattern Gaseous UV Photomultiplier in Liquid-Xenon" (by S. Duval, A. Breskin, R. Budnik, W.T. Chen, H. Carduner, M. Cortesi, J.P. Cussonneau, J. Donnard, J. Lamblin, P. Le Ray, E. Morteau, T. Oger, J.S. Stutzmann and D. Thers)

scintillation yield in gaseous and liquid argon for rare-lutskov, A. Bondar, A. Grebenuk)

ther Developments and Tests of Microstrip Gas Counters - Oliveira, V. Peskov, Pietropaolo, P. Picchi).

2010

Flow Simulations for gaseous detectors" (by D. Abbaneo, Garcia, J. P. Chatelain, G. Faber, L. Ropelewski, S. Duarte 4. Van Stenis, A. Sharma, L. Benussi, S. Bianco, S. Passamonti, D. Piccolo, D. Pierluigi, A. Russo, G. Saviano, A. E. Oliveri, G. Magazzu, Y. Ban, H. Teng, J. Cai)

struction of the first full-size GEM-based prototype for the y D. Abbaneo, S. Bally, H. Postema, A. Conde Garcia, J. P. ski, S. Duarte Pinto, G. Croci, M. Alfonsi, M. Van Stenis, A. S. Colafranceschi, F. Fabbri, L. Passamonti, D. Piccolo, D.), G. Saviano, A. Marinov, M. Tytgat, N. Zaganidis, M.

Hohlmann, K. Gnanvo, M.G. Bagliesi, R. Cecchi, N. Turini, E. Oliveri, G. Magazzu, Y. Ban, H. Teng, J. Cai)

RD51-Note-2010-007 – "First tests of "bulk" MICROMEAS with resistive cathode mesh" (by R. Oliveira, V. Peskov, Pietropaolo, P. Picchi)

RD51-Note-2010-006 – "A spark-resistant bulk-micromegas chamber for high-rate applications" (by T. Alexopoulos, J. Burnens, R. de Oliveira, G. Glonti, O. Pizzirusso, V. Polychronakos, G. Sekhniaidze, G. Tsipolitis, J. Wotschack)

RD51-Note-2010-005 – "Characterization of GEM Detectors for Application in the CMS Muon Detection System" (by D. Abbaneo, S. Bally, H. Postema, A. Conde Garcia, J. P. Chatelain, G. Faber, L. Ropelewski, E. David, S. Duarte Pinto, G. Croci, M. Alfonsi, M. van Stenis, A. Sharma, L. Benussi, S. Bianco, S. Colafranceschi, D. Piccolo, G. Saviano, N.

**RD51 Notes: 2 in 2013
12 in 2012
17 in 2011;
9 in 2010;
7 in 2009**

We encourage everybody to submit results of your work (before journal publication) and internal documentation as RD51 internal notes

WG5 – Electronics & Scalable Readout Systems

Legal documents required for SRS distribution to the RD51 institutes are finalized

Caveat: situation only resolved for countries, which does not require license, based on “Commerce Control List” (cat. NS2) – mostly Europe, Switzerland & few others

Institute Name
[Street Address] • [City], [Postal Code]
Phone: [Your Phone] • Fax: [Your Fax] • E-Mail: [Your E-Mail]
Web: [Web Address]

Date: [Insert Date]

CERN
The European Organization for Nuclear Research
Attention: Philippe Faethout
Cc: Alessandro Marchioro
PH-ESE
CH 1211 Geneva 23
Switzerland

SUBJECT: Letter of Compliance Concerning Deep-Submicron Technology Circuits

Dear Sirs,

As an authorized representative of [Institute Name], I herewith confirm that [Institute Name] understands and agrees to comply with the provisions listed hereunder governing any and all integrated circuits manufactured in Deep-Submicron technology and made available to us by or on behalf of CERN (“the circuits”):

(1) Notwithstanding any other agreement or understanding entered into by [Institute Name], The [Institute Name] assumes responsibility in full for any loss, damage, fine or penalty incurred as a result of its failure to comply with these provisions;

(2) The [Institute Name] shall use the circuits exclusively for scientific research purposes and shall not transfer or (re)sell them for any other purpose;

(3) The [Institute Name] shall not cause the circuits to meet or exceed all (that is, cumulative) five of the following characteristics:

(a) a total dose of 5×10^3 Rads (Si);

(b) a dose rate upset threshold of 5×10^3 Rads (Si)/sec;

(c) a neutron dose of 1×10^{16} n/cm² (1 MeV equivalent);

(d) a single event upset rate of 1×10^{-10} errors/bit-day or less, for the CREME96 geosynchronous orbit, Solar Minimum Environment;

(e) single event latch-up free and having a dose rate latch-up threshold of 5×10^3 Rads (Si).

SRS Distribution Procedure;

➤ **Every institute has to sign “Letter of Compliance” with RD51 spokes and send original to A. Marchioro**

➤ **Order your SRS systems/hybrids from CERN Store**

➤ **Pick-up hybrids from A. Marchioro office ([PH-ESE-ME, 77319](#))**

SRS user status 2013

1. ALICE EMCAL Calorimeter upgrade, ORNL, SRS readout backend via DTCC links and 24 SRU's, DATE Online system, being installed
2. ATLAS upgrade CERN, MAMMA project NSW, μ MEGAS, APV frontend SRS Eurocrates-SRU, MMDAQ Online, installed
3. ATLAS upgrade Mainz, μ MEGAS for MBTS, APV frontend-SRS Eurocrate, MMDAQ Online, waiting delivery
4. ATLAS Muon upgrade R&D, INFN Rome, APV frontend SRS Eurocrate, MMDAQ Online, delivered
5. ATLAS Saclay, μ MEGAS R&D, APV frontend SRS Minicrate, MMDAQ Online, delivered
6. NA62 CERN straw tracker upgrade with μ MEGAS, APV frontend with SRS Minicrate, MMDAQ Online, delivered
7. CMS upgrade CMS GEM collaboration CERN, Muon Endcaps, design of VFAT frontend digital readout SRS, ongoing with IFIN-HH
8. TOTEM upgrade GEMs Baris testlab, OPTO-Rx card design, Minicrate, Eurocrate, SRU, DATE Online, delivered
9. BNL GEM detectors, APV frontend-SRS Minicrate, RCDAQ Online, delivered
10. Stony Brook GEM detector R&D, APV frontend SRS Minicrate, RCDAQ Online, delivered
11. Bonn Phys. Inst. R&D for ILC, T24 DESY testbeam, Timepix Array Ingrid Module adapter for SRS, Eurocrate, Online unknown, ongoing
12. Florida Inst Tech GEMs, Muon Tomography for Homeland security, 15k channel SRS prototype Eurocrate, DATE Online, delivered
13. Géosciences Azur-CNRS-UNSA, Muon Tomography w. μ MEGAS for geology, APV frontend SRS Eurocrate, DATE Online, delivered
14. GDD lab RD51, CERN, R&D for GEM and μ MEGAS, APV frontend SRS Euro and Minicrates, DATE, Labview MMDAQ, delivered
15. HIP, HELSINKI, characterization MPGAD detectors, APV frontend SRS Eurocrate, DATE and Labview, delivered
16. INFN Napoli, ATLAS. Development of SRS Hardware and Firmware, Labview, delivered
17. Jefferson Lab, Virginia UVA upgrade GEM readout system, APV frontend SRS Eurocrate, DATE online, partially delivered
18. Yale University, GEM development ALICE, APV frontend SRS Eurocrate, DATE Online, delivered
19. NEXT Coll. small Xenon TPC with PM and Si PMs, SRS readout electronics co-development, SRS Eurocrate and SRU, DATE, delivered
20. UNAM, MEXICO, MX, R&D on THGEM, APV frontend SRS Minicrate, DATE Online, delivered
21. Radiation Laboratory, Nishina Center, RIKEN, APV frontend SRS Eurocrate, Online unknown, delivered
22. J-PARC /E16 experiment, GEM based tracking, APV frontend SRS Minicrate, Online Unknown, partially delivered
23. Jefferson Lab SHM spectrometer triple GEM, APV frontend SRS Eurocrate, DATE Online, waiting
24. Harvard Univ. Physics, APV frontend SRS Minicrate, Online unknown, waiting
25. Tokyo Univ. ATLAS, APV frontend SRS Eurocrate, Online unknown, waiting
26. WIS and Aveiro Univ. GEM validation, APV Frontend SRS Eurocrate, MMDAQ and Labview, being delivered
27. East Carolina University, Health Physics, APV frontend, SRS Eurocrate, Labview, waiting
28. Munich LMU / ATLAS μ MEGAS, APV frontend SRS Eurocrate-SRU, MMDAQ Online, partially delivered
29. NCSR Democritos ATHENS, APV frontend SRS Minicrate, Online unknown, waiting
30. IFIN-HH-Bucharest new Detector lab, APV and VFAT frontend, SRS Eurocrate and SRU, Labview, delivered
31. ATLAS NSW CERN, SRS-ATCA pilot system, MMDAQ Online, waiting
32. ALICE FOCAL ORNL, SRS-ATCA pilot system, DATE Online, waiting
33. NEXT Collaboration, SRS-ATCA pilot system, DATE Online, waiting
34. Lunds Univ, ILC TPC, SRU for 24 channel DTCC link readout, Online unknown, delivered

Potential new SRS users

1. LAPP, Annecy, **SRS hybrid with MicroROC chip for ATLAS** , no news
2. Pacific Northwest National Laboratory, Radiation detection and Nucl. Sci, **interest in APV SRS system**, no CERN team account
3. Radcore LTD Republic of Korea, GEM production , **small SRS system** , no team account
4. Newflex GEM production, South Korea , **small SRS system** , enquiry status
5. GIF++ team CERN, **interested in SRS as GIF++ base installation with DATE Online system** , ongoing discussions, waiting
6. Budker INP, Novosibirsk, Deuteron Exp. @ VEPP-3 , **APV readout SRS** , APV order impossible, radhard export restriction
7. Tsinghua Univ. China , R&D on GEM Imaging detectors, **APV readout SRS** , APV order impossible, radhard export restriction
8. SAHA Inst Nucl Phys,KOLKATA, IN , Laboratory for characterization of MPGDs , APV order impossible, radhard export restriction
9. USTC Shanghai, CN , **characterization of GEM and MicroMega with SRS** , APV order impossible, radhard export restriction
10. Univ . Texas, DOE proposal with 18 GEMs , no news
11. National Univ. of Colombia, Dosimetry for mediical appl, no team account, no news
12. BNL Phenix upgrade, **small SRS systems already delivered** , no news
13. Helsinki University, Totem , no news
14. Freiburg University, **verbal enquiry for SRS system**, no news
15. Univ Calabria It, **email enquiry for SRS**, no news
16. Uni. Kobe, JP J-PARC /E16 upgrade , **large SRS system**, prelim offer sent
17. ALICE ITS, **SRS 16 ch. ADC card for test of ITS chips** , enquiry
18. NEOHM Italy, **SRS system for test of hybrid production for CERN store**, sending offer
19. Geoazur-CNRS-UNSA, Valbonne, FR, **upgrade of existing SRS uMega readout system**, **APV readout Eurocrates** ,waiting for news

CERN Store SRS Production Schedule in 2013

A.) Ongoing Q1 production to satisfy pending orders expected Mai 2013

- 5 Minicrates A (2k APV channels)
- 4 ADC cards
- 5 FEC cards
- 3 ATX adapters

A.) New Q2 production for partially existing orders expected July 2013

- 15 Minicrates AB (new, up 4 kA APV channels)
- 5 Eurocrates HP
- 25 ADC cards
- 25 FEC cards
- 3 CTF prototypes
- 250 APV Master hybrids
- 250 APV Slave hybrids

Hans.Muller@cern.ch CERN PH-AID

Estimated SRS-ATCA Startup in 2013 (with EicSys) → WG5 presentations

WG6 – Production

**NEW: Special Session devoted to the discussion of the MPGD
QA Rules and Procedures – Wednesday, 14:00 – 17:00**

- 14:00 Quality test of Kloe Cylindrical GEM
- 14:20 Quality control experience with foils of the ALICE TPC prototype
- 14:40 Quality control that has been done for GEM TOTEM detectors
- 15:00 New resistive Micromegas electrodes made with vacuum deposition
- 15:20 New results from CLAS12 forward resistive
Micromegas produced by CIREA and CERN
- 15:40 Expected QC on CMS GE1/1 large volume production
- 16:00 Facility upgrade single mask production
- 16:20 Recent progress in large THGEM production
- 16:40 Open discussion

WG7 – Test Beams

From: Yorgos Tsipolitis <yorgos.tsipolitis@cern.ch>

Date: 09 Απριλίου 2013 21:05:18 μ.μ. GMT+0300

To: rd51-all

Cc: Yorgos Tsipolitis <yorgos.tsipolitis@cern.ch>

Subject: WG7 questionnaire

Dear colleagues,

as you all know we will not have any beam this year at CERN.

We would like to take the opportunity to review our test beam setup and everything else related to the test beam periods.

It would be very helpful if you could fill the **following questionnaire and return it to us by the next RD51 mini-week (21st April)**

Best regards

Eraldo and Yorgos

→ Please provide feedback to the Questionnaire

CERN Test Beam @ PS/SPS

Current schedules for the injector on the BE department web page:

https://espace.cern.ch/be-dep/BEDepartmentalDocuments/BE/Injector_Schedule_2014.pdf

https://espace.cern.ch/be-dep/BEDepartmentalDocuments/BE/Injector_Schedule_2015.pdf

2014

Start East hall physics (**PS test beams**) is scheduled **July 15th 2014**

Start North Area physics (**SPS test beams**) is scheduled on **Oct 13th 2014**

End PS/SPS December 15th.

2015

PS restart May 4th,

SPS around June 15th,

End December 7th.

A call for **beam requests** will be sent in the **4th quarter of 2013.**

PS: July 15th 2014
SPS: Oct 13th 2014

Test Beam @ DESY

If you are planning to use the DESY test beam facility in 2014 please send before **April 12th 2013** following information to testbeam-2013@desy.de:

April 12th 2013

- project name
- number of requested weeks
- preferred month(s)
- preferred infrastructure (beam telescope, magnetic field, Š)

This is **not yet the official** test beam request! The official test beam booking for 2014 will follow in summer.

You can find information of the DESY test beam on testbeam.desy.de. Groups from European institutions can apply for funding via AIDA (<http://aida.web.cern.ch>).

Neutron Test Beam @ Demokritos

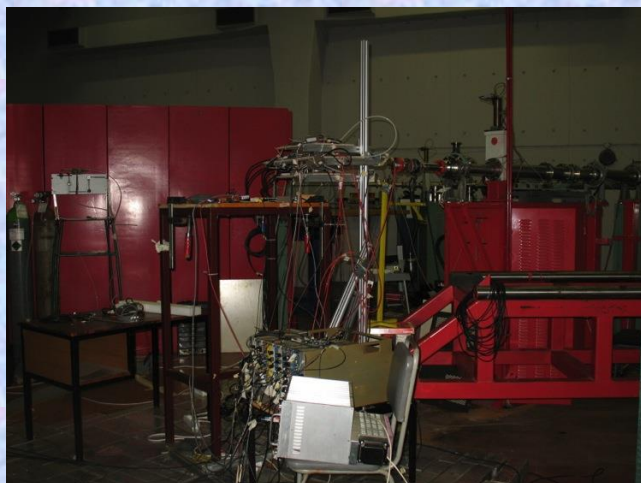
- Neutron energies up to 25 MeV depending on the initial reaction
- Neutrons of 5.5 MeV with fluxes up to 1.5×10^6 n/cm² s
- used to test ATLAS MDT's
- for the upgrade of the ATLAS NSW TGC's & Micromegas were (and will be) tested
- GEM detectors were tested

Talk on wg7 (Yorgos)

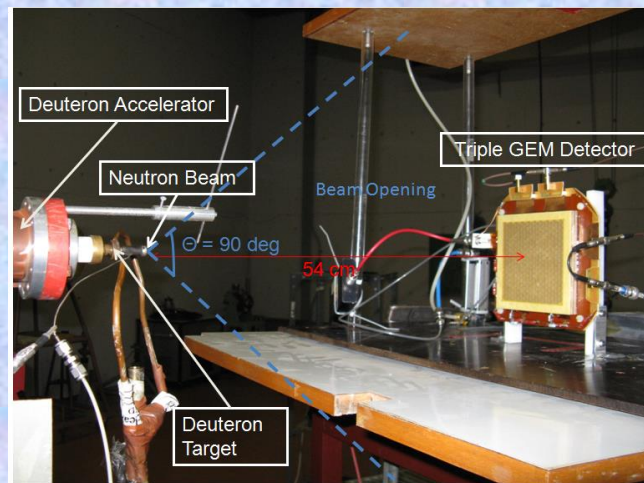
Nuclear Reaction	Proton/Deuteron Energy Range (MeV)	Neutron Energy Range (MeV)
${}^7\text{Li}(p,n){}^7\text{Be}$	1.9 to 8.4	0.1 to 6.7*
${}^2\text{H}(d,n){}^3\text{He}$	0.8 to 8.4	3.9 to 11.5**
${}^3\text{H}(d,n){}^4\text{He}$	0.8 to 8.4	16.4 to 25.7***

Neutron fluencies can reach $\sim 5 \times 10^6$ neutrons/cm² s but for d-³H is lower an order of magnitude compared to the d-²H reaction due to cross section energy dependence

**MAMMA
neutron
Beam Test
at
Demokritos**



**GEM
neutron
Beam Test
at
Demokritos**



E. Oliveri, Y. Tsiolitis, WG7 Conveners

The New Irradiation Facility in the CERN PS east Area

Talk on wg7 (F.Ravotti)

Primary PS proton beam

- Beam energy: 24 GeV/c

Slow extraction

- Spill intensity: $\sim 3 - 5 \times 10^{11}$ p
- Spills duration: ~ 400 ms
- # spills per CPS (typical): 1 to 4
- CPS length (typical): 45.6 sec
- Beam spot FWHM (typical): 1.5×1.5 cm²
- Beam spot FWHM (max.): $\sim 5.0 \times 5.0$ cm²

Proton flux (IRRAD1)

- $\sim 1 - 5 \times 10^{13}$ p cm⁻² h⁻¹
- $\sim 3 - 10 \times 10^{14}$ p cm⁻² day⁻¹
- $\sim 1 \times 10^{16}$ p cm⁻² 20days⁻¹ (year average)



Irradiation Facilities: Services



An irradiation facility is a **complex infrastructure and service organization** going far beyond "providing just the beam"!

- **Low volume, passive irradiations are performed by us.** Clients are requested to participate in extensive or complicated irradiations or in case of on-line measurements
- **Spectrometry laboratory** (14/R-012) and **storage bunker** (13/S-027)
- **Irradiations outside CERN: PSI** (π -irradiation)

Planning Experiments

Support in producing sample holders (CNC machine) and dedicated experiments...

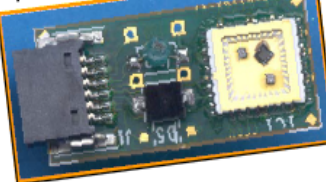
Material testing, R&D

Basic equipment for tests (e.g. IV/CV test-bench), R&D, expertise, consulting, recommendations to clients,...

Handling of material, shipping
Handling of activated test materials, "cold" shipping of samples (silicon detectors), transport inside CERN, ...

Dosimetry

PH RadMon boards, RADFETs, pin-diodes, activation foils, PAD, RPL, ...

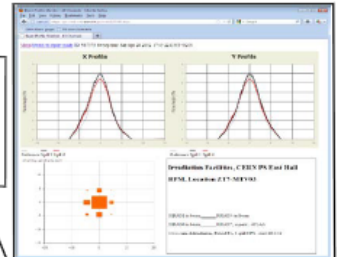
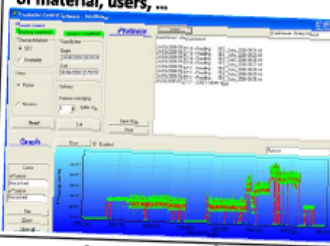


Safety

of operators, clients, irradiated equipment and materials.

Database system

Electronic logbook for irradiation history and condition for all samples, sample tracing, radiation levels, export of material, users, ...



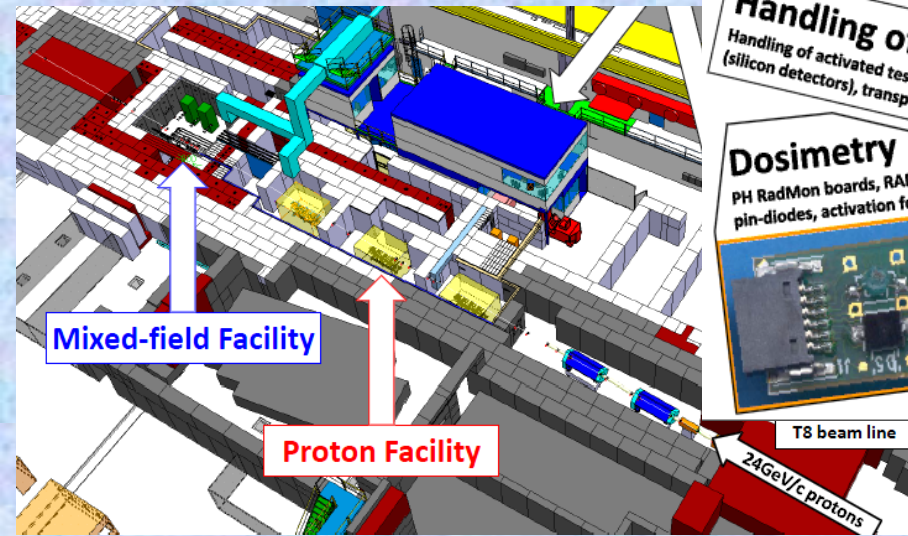
Beam monitoring tools
Beam profile monitoring on spill to spill basis, SEC, radiation levels, ...

Storage Facility

General service for PH department, equipped to handle and measure irradiated samples. RT and Low T storage, ...

F. Ravotti - RD51 mini week CERN - 22 April 2013

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Gdd – RD51 Laboratory

Talks on wg7 (Patrik and Eraldo)

- **Extension in progress. Completed (probably) in June 2013.**
- **Instrumentation:**
 - H. Muller Group: High Voltage (powering/monitoring) Modules stand alone and for the SRS.
 - CAEN: Support/Collaboration. Possibility to test commercial CAEN Modules in the lab and synergy to find solution for specific application.
 - High Cleanness SWPC (with PH-DT-DI Detector Infrastructure Group) to perform monitoring, gain stability and aging measurements.
 - Restored/New Equipment available: Vacuum system
 - Environmental/Gas System Parameter monitoring and lab DCS
- **Gaseous Detector Exposition** (permanent Lab Exposition & CERN Open Days 2013)
- **Summer Students 2013:** One official CERN Summer Student (X-Ray Imaging) and two not-official from external institutes

WG2: RD51 Common Projects in 2011 and 2012

2012: 3 Projects has been approved

- R&D on large area GEMs for the ALICE TPC upgrade (*GSI/ Tokyo / UNAM*)
- High resolution UV scanner for MPGD applications (*Wigner FCP/INFN Trieste/ INFN Bari*)
- Large-area THGEM detector evaluation with SRS electronics (*Weizmann/Coimbra/Aveiro*)

2011: 4 Projects are still ongoing

- Thin and high-pitch laser-etched mesh manufacturing and bulking (*Saclay / CERN / Bari*)
- Development of innovative resistive GEM alpha detectors for earthquakes prediction and homeland security (*INFN Bari / UNAM, Mexico / INFN Padova / INFN Frascati*)
- MPGDs technology laboratory for training, development, fabrication, applications and innovation (*Universidad Antonio Nariño, Columbia / Brookhaven National Laboratory/ Helsinki Institute of Physics / HEPTech / GSI Helmholtzzentrum*)
- A low mass microbulk with real XY strips structure (*NCSR Demokritos / Saclay/ Laboratorio de Física Nuclear y Astropartículas, Universidad de Zaragoza / CERN*)

❖ The RESULTS of the COMMON projects MUST BE SUBMITTED AS RD51 NOTES

❖ Please make references to the RD51 when you present Results of Common Projects

❖ CALL for the 2013 Common Projects → Later this year → MB will review, evaluate and potentially improve the CP procedures → benefits for the RD51 Community

2008-2013: RD51 Collaboration Organization



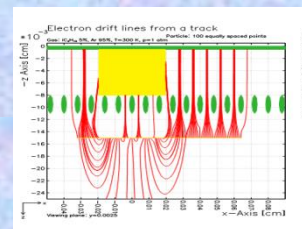
Consolidation around common projects: large area MPGD R&D, CERN/MPGD production facility, common electronics developments, software tools, beam tests

**Large area (MM, GEM, THGEM)
Design optimization
(e.g. THGEM, Resistive MM)**



**“RD51 Common Projects”
(Generic R&D)**

WG2:



WG1:

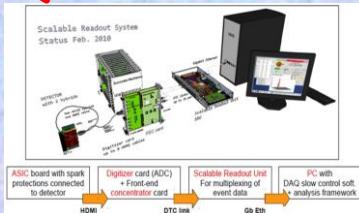
WG5:

RD51

WG4:

**Software and
Simulation**

**MPGD SRS
Electronics**



WG7:

WG6:



**RD51 Common
Test Beam Facility**



**CERN MPGD Workshop
& Industrialization**



Executive Summary of RD51 Achieved Goals and Milestones:

- ❖ **Consolidation** of the Collaboration and **MPGD Community** Integration (> 80 institutes, 450 members);
- ❖ **Major progress in MPPD Technologies**, in particular, large area GEM, Micromegas and THGEM; some picked up by experiments, including LHC upgrades;
- ❖ **Secured future of the MPPD Technologies** development through the **TE MPE workshop upgrade** and FP7 AIDA contribution
- ❖ **MPPD industrialization**; contacts with industry for large volume production; first runs
- ❖ **Major improvement to the MPPD simulation** software framework allowing many applications
- ❖ **Development of common, scalable readout electronics** (> 20 development and user groups); industrialization with PRISMA and EISYS and availability through CERN store;
- ❖ **Infrastructure for common RD51 test beam** and facilities (> 20 user groups);

These points will be summarized in the RD51 Executive Summary for the LHCC:

If you are interested to submit summary of YOUR GROUP ACTIVITIES

→ please send to the RD51 spokes by the end of April

→ will appear in the Appendix to the Executive Summary for the LHCC

Future RD51: New Projects and Reviving Earlier Ones ...

- ❖ Continuation of the R&D support for the experiments in many domains (...), and LHC upgrades, in particular **(WG1)**;
- ❖ Generic R&D (new structures/ideas, det. physics) – RD51 Common Projects **(WG2)**
Development of new structure and consolidation of the existing structures
- ❖ Applications – organization of series of specialized workshops disseminating MPGD applications beyond fundamental physics – RD51 research + industry + potential users **(WG3)**
- ❖ Development and Maintenance of Software & Simulation Tools;
basic studies & software support for the RD51 community **(WG4)**
- ❖ Development and Maintenance of the SRS Electronics **(WG5)**
An extended support for the SRS including new developments and implementation of additional features ...
- ❖ MPGD Industrialization and QA Control – GEM, Micromegas, THGEM **(WG6)**;
Completion of the industrialization of main technologies (GEM, MM, THGEM)
- ❖ Maintenance and extension of the RD51 lab and Test-Beam Infrastructure **(WG7)**
- ❖ MPGD Education and Training: organization of schools for students and newcomers & academic Training **(NEW WG)**

RD51: New Ideas

❖ **INDUSTRY-ACADEMIA RD51 EVENTS:**

- **Research + industry + potential users focused on dedicated applications (medical science, homeland security, neutron detection, ...)**
- **Perspectives of MPGDs for Neutron Detection (October 17, 2013) → in conjunction with RD51 Collaboration Meeting (October 14-16)**

❖ **RD51 EDUCATION AND TRAINING SCHOOLS:**

- **RD51 Electronics School → preliminary → end of the 2013 (H. Muller)**

Also trying to fix dates (late 2013 – early 2014):

- **Detector Design and Assembly School**
- **Software School**

Schools are not limited to CERN → if you are interested to organize school in your country & region → contact RD51 Spokespersons

Elections of the RD51 Management in 2013:

- ❖ **To be elected**
 - **CB Chair and CB Deputy Chair**
 - **Spokespersons**
- ❖ **Term: January 1, 2014 - December 31, 2015**
- ❖ **Nominations by Zaragoza meeting (July 1)**
- ❖ **Electronic vote till end September 2013**
(before next RD51 Collaboration Meeting in October)

RD51 Member List (84 institutes):

- **Call (last year) to update RD51 Membership list (39 institutes responded)**
- **New RD51 list will be distributed this week → please check and/or update it, if not done yet;**