Informe
Departamento Experimental

Algunos preliminares:

- Berta tiene un mes muy cargado de compromisos profesionales (dos viajes largos antes y después de esta reunión), de ahí que presente yo.
- No es posible cubrir todo en profundidad en el tiempo disponible (15 mins para 11 grupos). Disculpas anticipadas
- Gracias por la colaboración de todos los grupos.

J.J. Hernandez-Rey
IFIC (CSIC-UV)

On behalf of the
ANTARES Collaboration

Reunión IFIC , 18 diciembre 2014, IFIC, Paterna

LHC

ATLAS-SCT

ATLAS-SCT

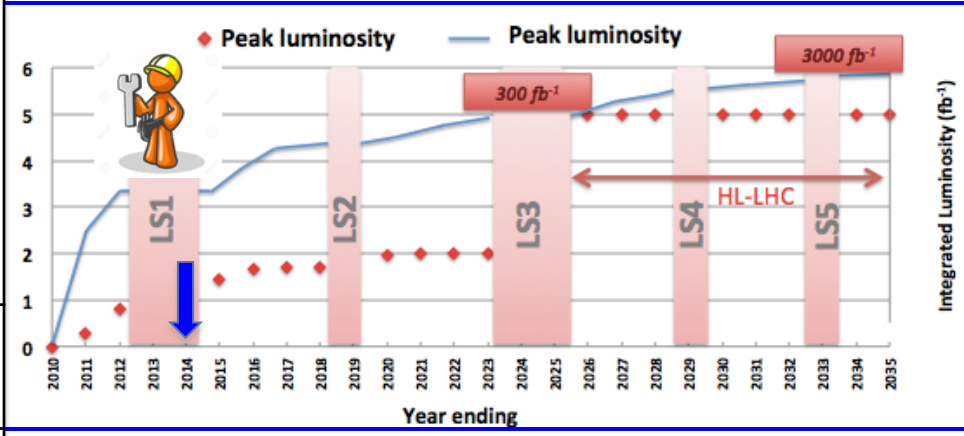
FPA2012-39055-C02-01

Personal FPA-2012

Carmen García	Staff
Eduardo Ros Martínez	Staff
Salvador Martí García	Staff
Carlos Lacasta Llacer	Staff
M. José Costa Mezquita	Staff
Susana Cabrera Urbán	Staff
Juan Fuster	Staff
Santiago Gonzalez	Staff
Marcel Vos	Staff
Vasiliki Mitsou	Contrato
José Enrique García Navarro	RyC
Matt King	Postdoc
Emma Torró	Postdoc
José Bernabeu Verdú	Engineer
Francisco J. Sánchez Martínez	Engineer
Ricardo Marco Hernández	Engineer
Carlos García	Engineer
David Santoyo	Engineer
Carles Solans	Engineer
Adrian Platero	Técnico FP
Adrián Irles Quiles	Student
Vicente Ramón Lacuesta Miquel	Student
Emma Torró Pastor	Student
Victoria Martinez	Student
Elana Romero Adán	Student
Sebastián Pedraza	Student
Urmila Soldevilla Serrano	Student
Javier Jimenez	Student
Daniel Rodriguez	Student
Laura Barranco	Student
Davide Melina	Student

Personal de apoyo: J.V. Civera, F. Gonzalez, J. Nacher, R. Carrasco

Planes del LHC hasta el HL-LHC



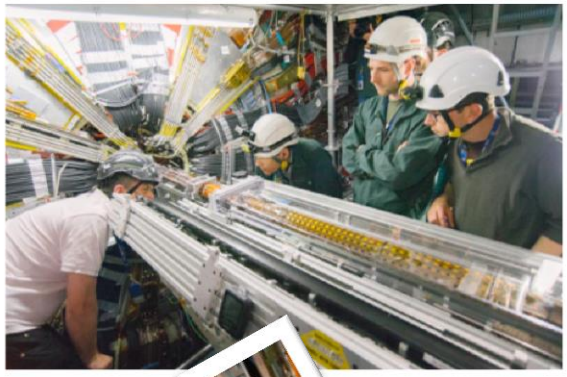
Aunque ATLAS no ha tomado datos en 2014, ha sido un año de mucha actividad:

- Intervención en el Detector Interno (ID) y puesta a punto.
- Análisis de datos del run 1 (8TeV).
- Preparación del run 2 (aumento de la energía a 13,5 TeV).
- Toma de cósmicos al final del año.

Intervención en el detector de trazas (ID)

El ID se ha abierto para instalar el IBL: Pepe y Paco son responsable de la tomas de tierra del detector.

Paco y Pepe preparando la apertura del ID para la instalación del IBL



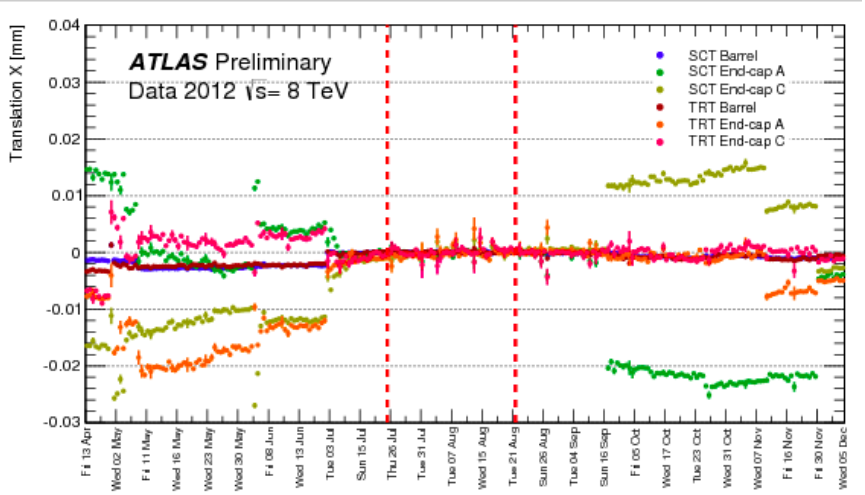
Mayo-2014 durante la instalación del IBL

La parada de ATLAS ha sido una buena oportunidad para visitas el experimento

Informe Semanal

Algunas de las visitas VIP

Algunos resultados del grupo
(Alineamiento y primeros datos)



Se ha avanzado durante el shut-down en el alineamiento con trazas del ID usando datos de 2012 → somos sensibles a movimientos de pocas micras debidos a cambios en las condiciones ambientales del detector (temperatura, intensidad de campo magnético, etc.)

ATLAS-CONF-2014-047

En la última parte del año se ha cerrado el detector y se han realizado varias campañas de toma de cósmicos para poner en marcha el detecto y obtener las primeras calibraciones.

Se ha comprobado el funcionamiento de la nueva capa del detector de trazas (IBL)

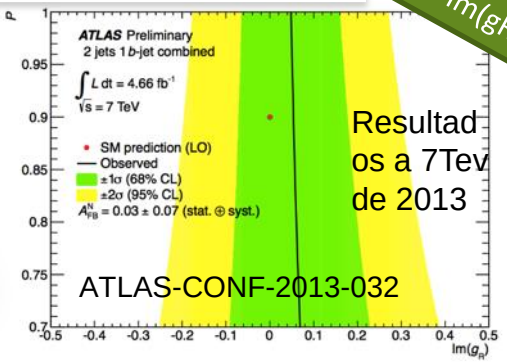
Algunos resultados del grupo (tops)

Tesis S. Pedraza (para 2015)

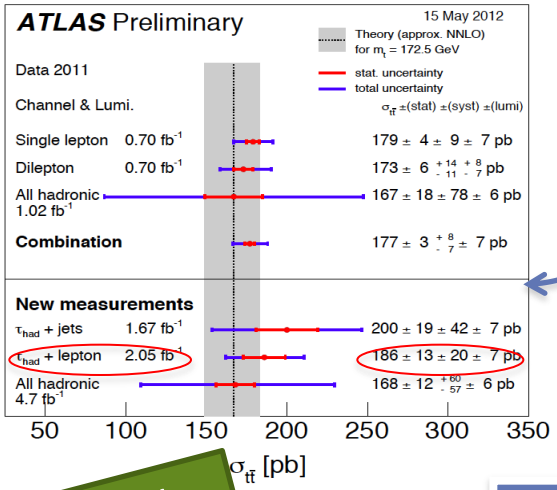
En 2013 realizamos la primera medida de la polarización del W en el canal t de producción de single top a 7TeV. En 2014 hemos actualizado la medida a 8TeV y medido las asimetrías. Resultados en fase de aprobación para la comunicación **ATL-COM-PHYS-2014-1538**

Tesis M. Moreno (2014)

Primer límite de Im(gR)



Tesis T. Pérez (2014)



Actualización de la medida de la sección eficaz de producción y relación de desintegración del top en el canal tau+lepton **ATL-COM-PHYS-2014-005.**

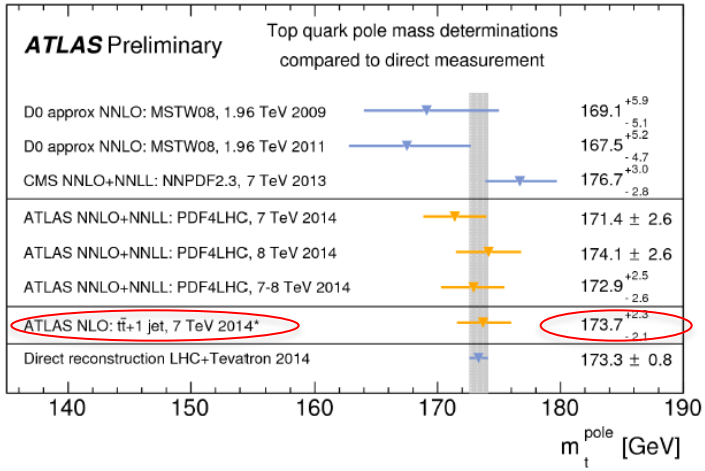
Sensible a física BSM, p.e. desintegraciones de top a Higgs cargados o SUSY

Nuevo método

Tesis A. Irles (2014)

Medida más precisa de la masa polo del top utilizando sucesos tt+ jets **ATL-COM-PHYS-2014-1443.**

$$m_t^{pole} = 173.71 \pm 1.50\ (stat.) \pm 1.43\ (syst.)^{+0.95}_{-0.49}\ (theo.)\ GeV$$



Algunos resultados del grupo (SUSY)

Z(→ℓℓ)+jets+MET Interpretados en RPV bilineal y *"General Gauge Mediation"* ➔ Exceso (3σ) a confirmar en run2

ATL-COM-PHYS-2014-1019.

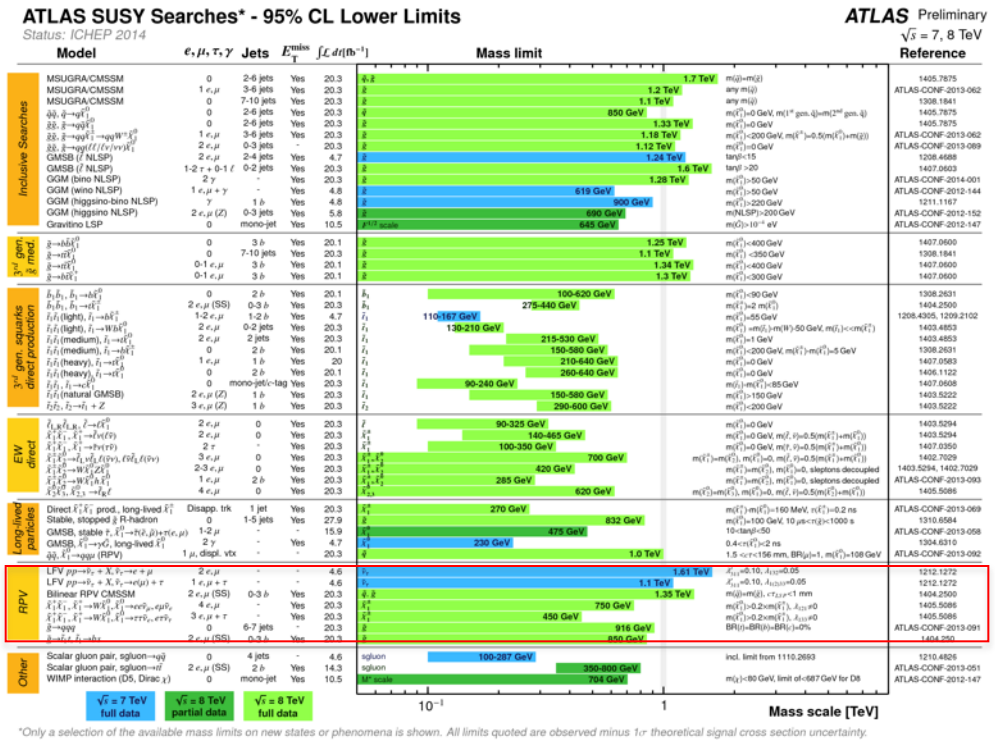
Tesis E Romero para 2005

Resultados anteriores: JHEP 05(2014)071, 52

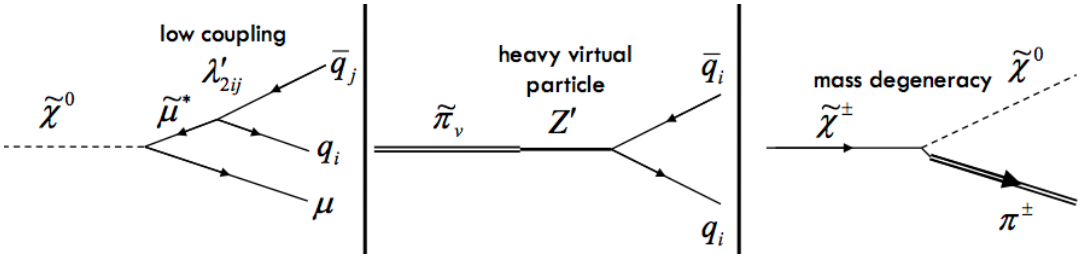
2 leptones del mismo signo Interpretados Natural pMSSM con bRPV (primera vez que se estudia estos modelos

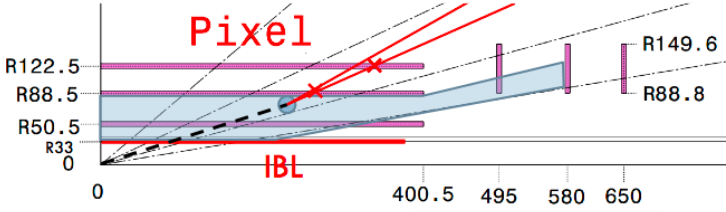
JHEP 06(2014)035

Resumen de todas las búsquedas en ATLAS



Desarrollo de nuevo un trigger para vértices desplazados en el run 2 usando FTR

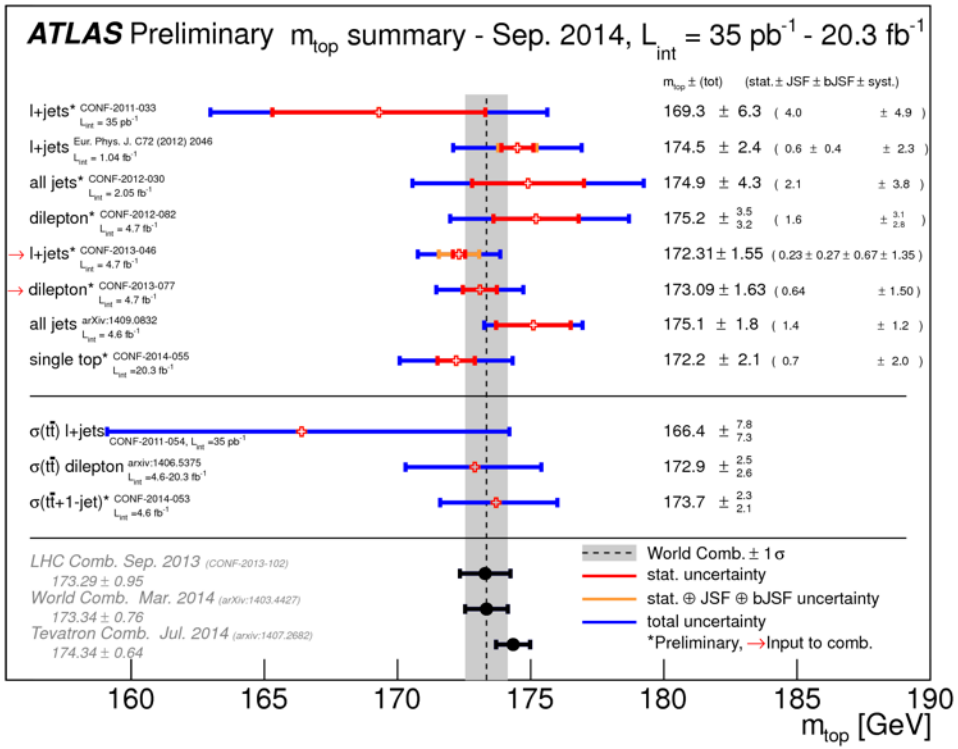




M. King

Otras actividades

Primera combinación de los datos de LHC y Tevatron



M. Costa miembro del LHC working group encargado de las combinaciones

Responsabilidades en 2014:

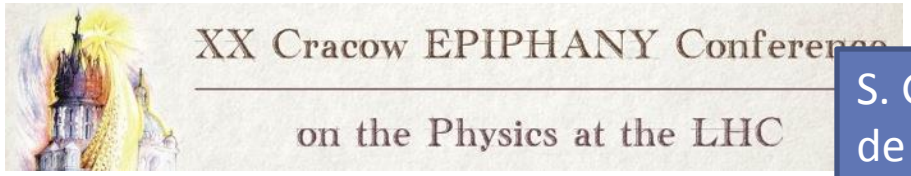
- ATLAS Physics Validation (J.E. García-Navarro).
- ATLAS MC production (J.E. García-Navarro).
- ATLAS contact person in the LHC Working Group (M. J. Costa)
- Alineamiento del detector Interno (S. Martí, S. Pedraza, J. Jiménez).

- Top Physics Validation (S. Cabrera)
- SUSY Physics Validation (V. Mitsou, E. Romero,)

Representando a ATLAS en las principales conferencias internacionales

C. Lacasta, M. King, V. Sanchaz, E. Romero

V. Mitsou



S. Gonzalez de la Hoz

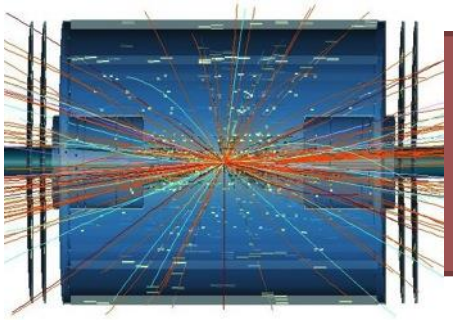
J. E. García Navarro

C. García

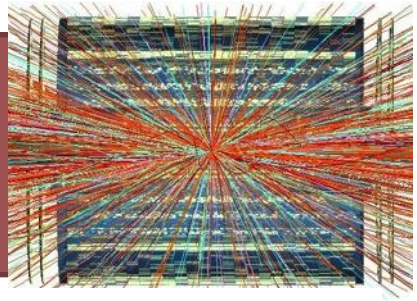
M.J. Costa

S. Martí

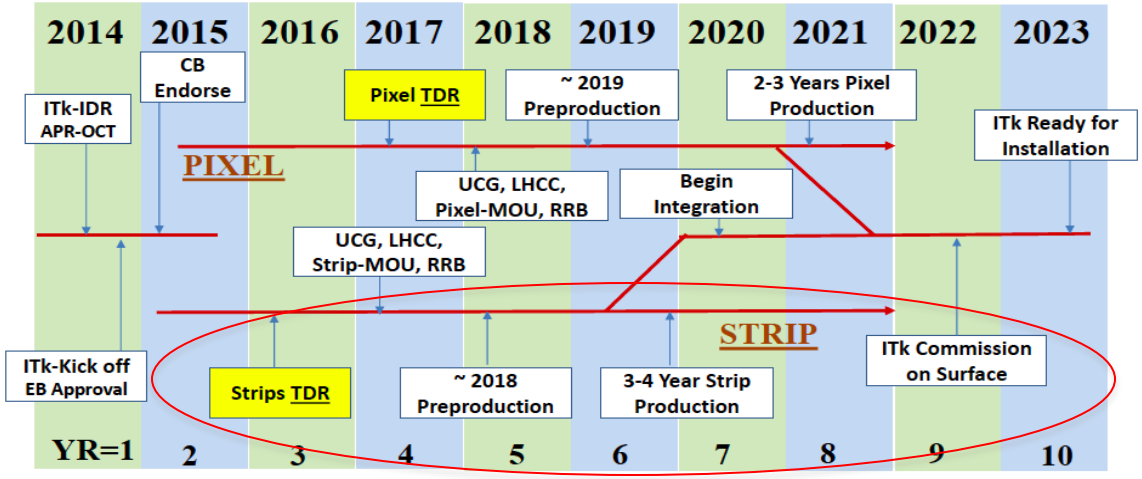
DANDO LOS ÚLTIMOS TOQUES DE ASPIRADORA
PARA COMENZAR LAS TOMA DE DATOS EN 2014



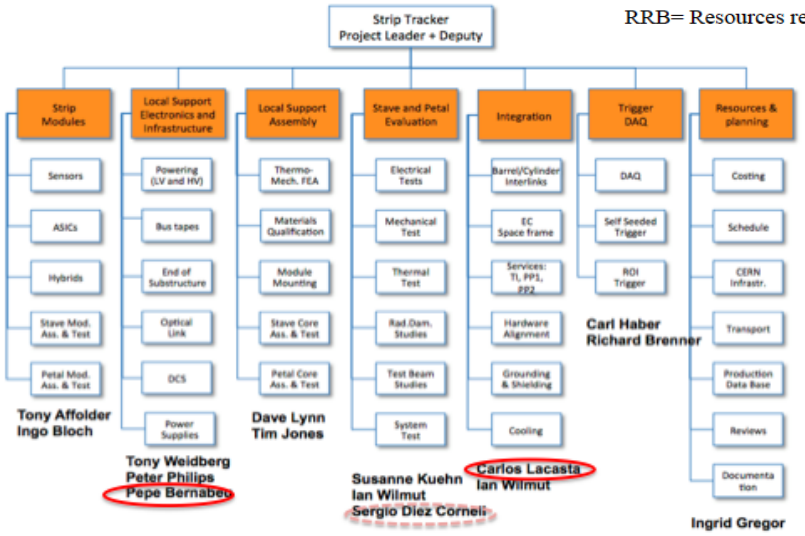
Actualización de ID (ITK)



Objetivo ir de la "Letter of Intent" (2012) al "Technical Design Report" en 2016, para comenzar 5 años de pre-producción y cons-trucción.



CB= collaboration board, EB=executive board, IMOU=interim memorandum of understanding, UCG=upgrade cost group, RRB= Resources review board, IDR=initial design review (internal), TDR=technical design report (external)



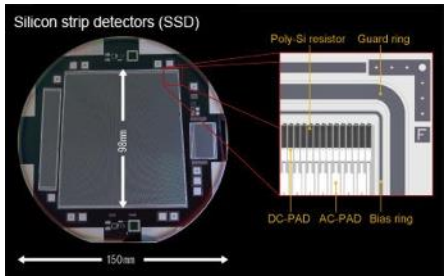
La comunidad del ITK-Strip esta organizada en grupos de trabajos. El IFIC coordina dos de estos grupos

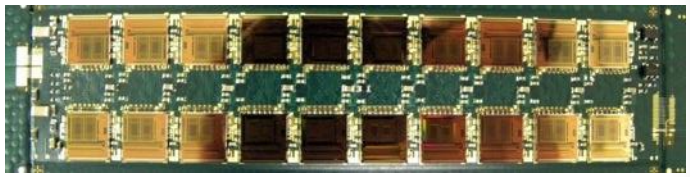
IFIC quiere ser uno de los centro de producción de módulos de los End-caps

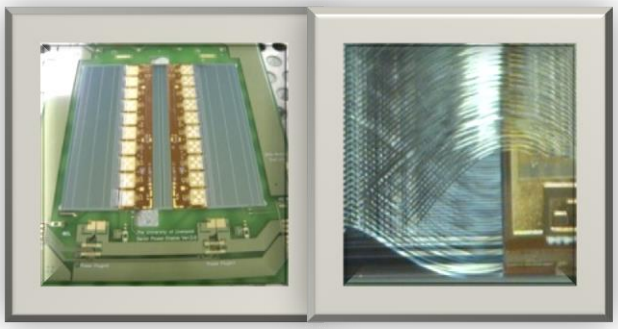
12784 perfect barrel sensors, 120 m^2
8064 perfect endcap sensors, 70.5 m^2

18912 hybrids in the barrel
11648 hybrids in the Endcap

20848 perfect modules



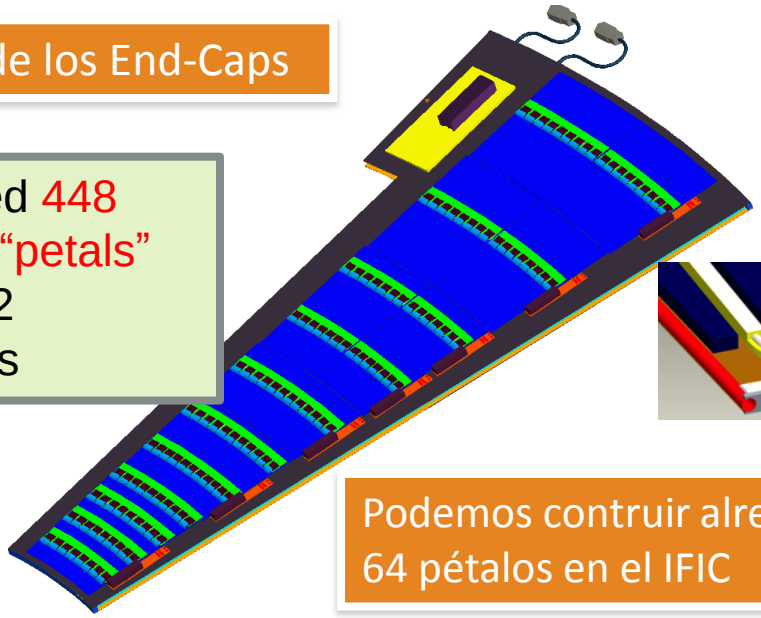


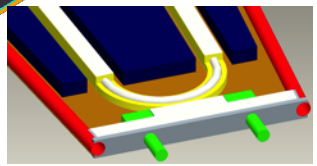


The hybrid is glued onto the sensor. Connection between sensor and readout ASICs is made with four rows wire bonding

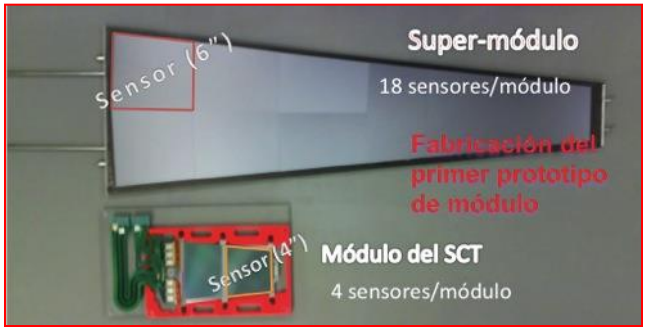
Petalos de los End-Caps

We need 448 perfect “petals” for the 2 endcaps

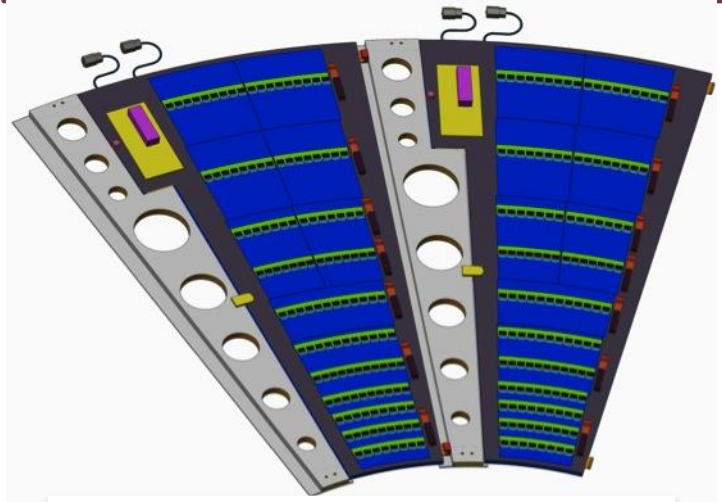




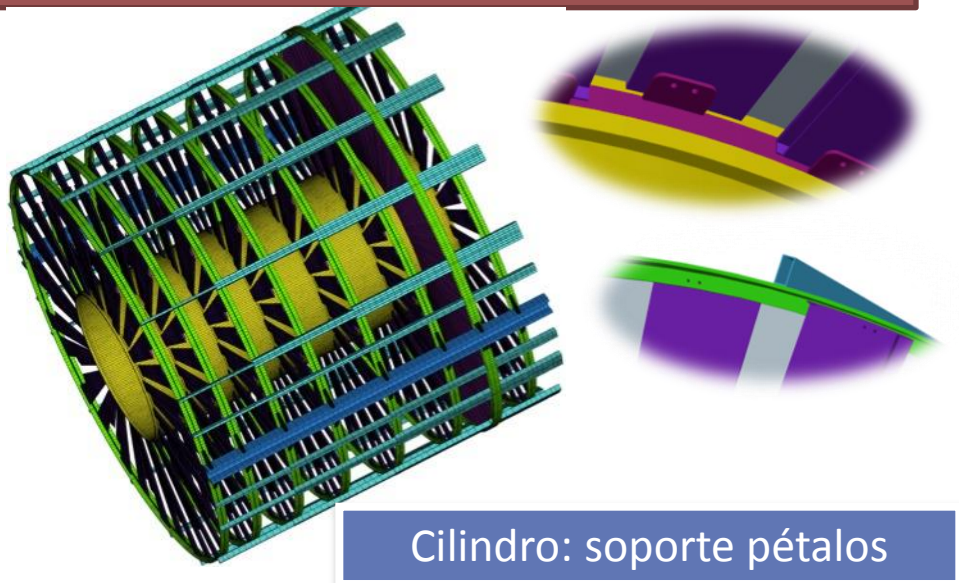
Podemos contruir alrededor de 64 pétalos en el IFIC



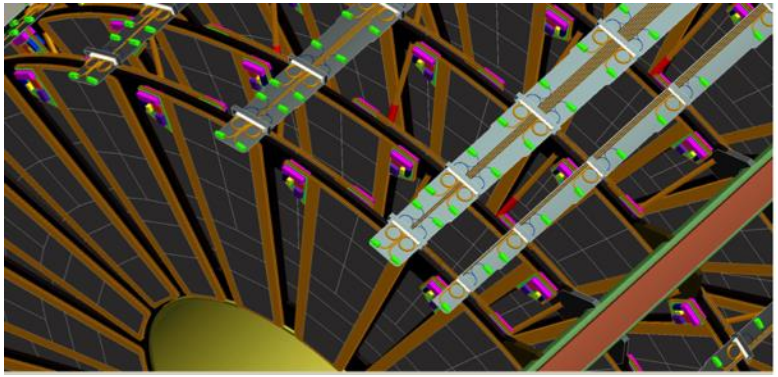
Actividades de diseño en el IFIC: Pétalos, servicios y cilindro

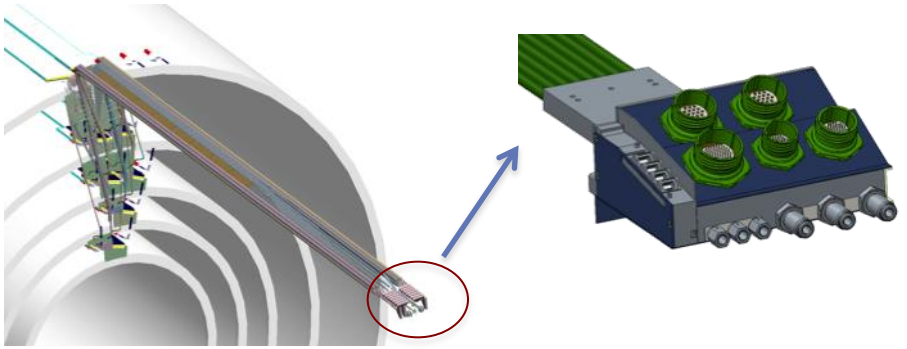


Petalos y soporte (blades)



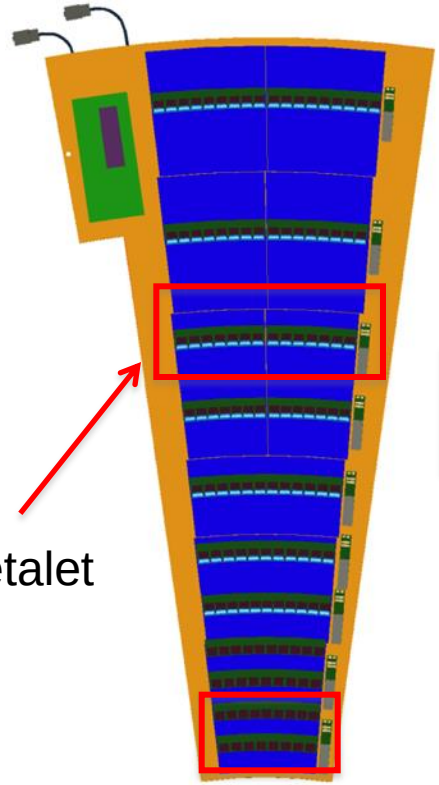
Cilindro: soporte pétalos



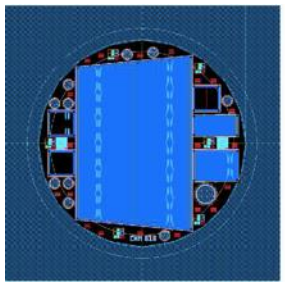


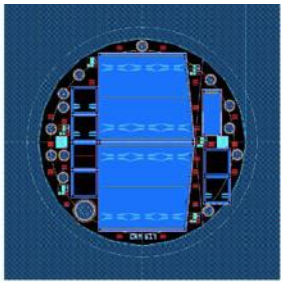
Servicios

Demostrador de la tecnología



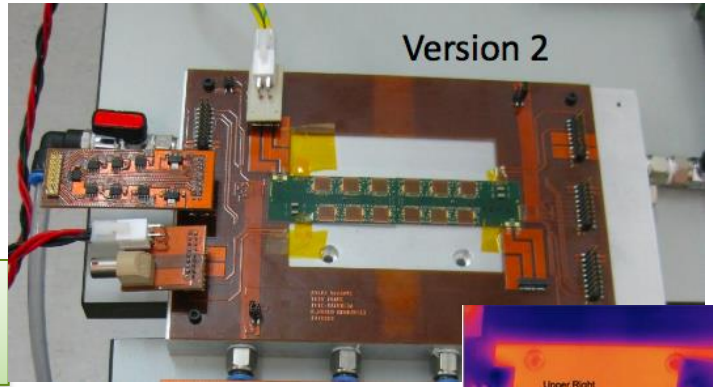
Petalet

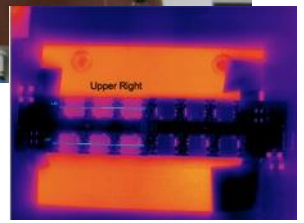




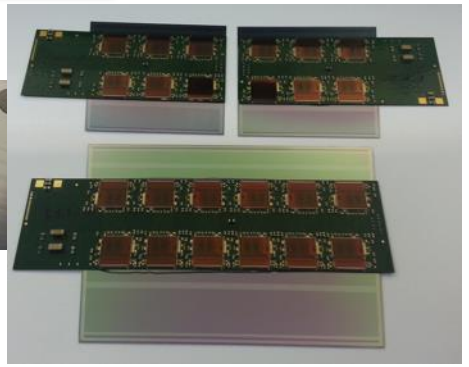
Sensores fabricados en el CNM para toda la colaboración

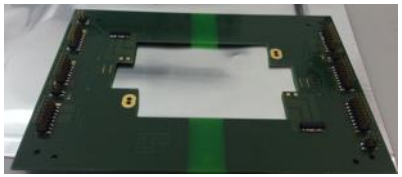
Diseño del híbrido

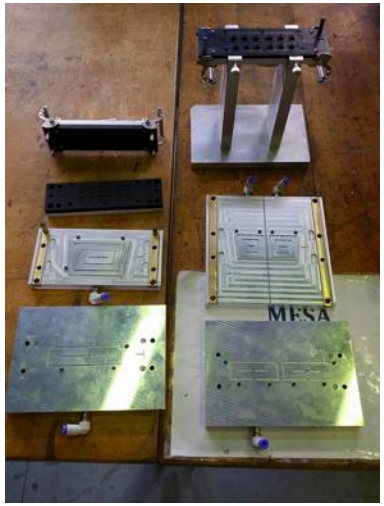




Pegado chips-hibrido







Diseño y fabricación de útiles de ensamblaje y de test

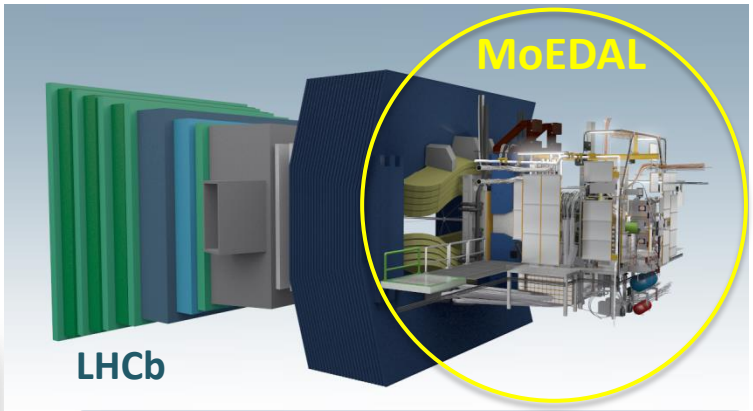
Pegado hibrido-sensores

MoEDAL

MoEDAL: Hunting highly ionising particles at LHC

MoEDAL is unlike any other LHC experiment:

- mostly **passive detectors**; no trigger; no readout
- the largest deployment of passive **Nuclear Track Detectors** at an accelerator
- the 1st time **trapping detectors** are deployed as a detector



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Vol. 29, No. 23 (2014) 1430050 (91 pages)
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DOI: 10.1142/S0217751X14300506

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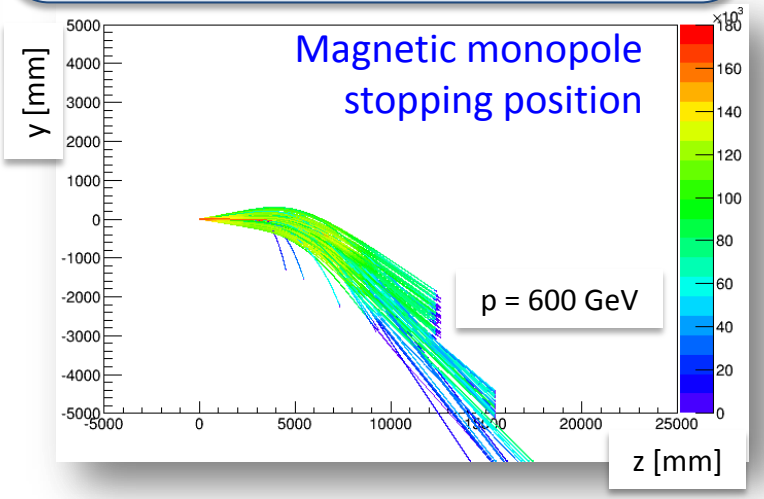
www.worldscientific.com

Search for *massive*, *long-lived* & *highly ionising* particles

The physics programme of the MoEDAL experiment at the LHC

- Magnetic monopoles, dyons
- Supersymmetry: sleptons, R-hadrons, …
- Long-lived Higgs H^{++}
- Black-hole remnants
- Quirks, Q-balls …



IFIC Valencia Team

IFIC INSTITUT DE FÍSICA CORPUSCULAR

- Team members: J. Bernabeu, M. King, V.A. Mitsou (leader), V. Vento, O. Vives
- Responsibilities
  - Geant4 detector simulation & particle propagation
  - simulation of monopole, monopolium & slepton production
  - V.A. Mitsou: Chairperson of Collaboration Board

TileCal

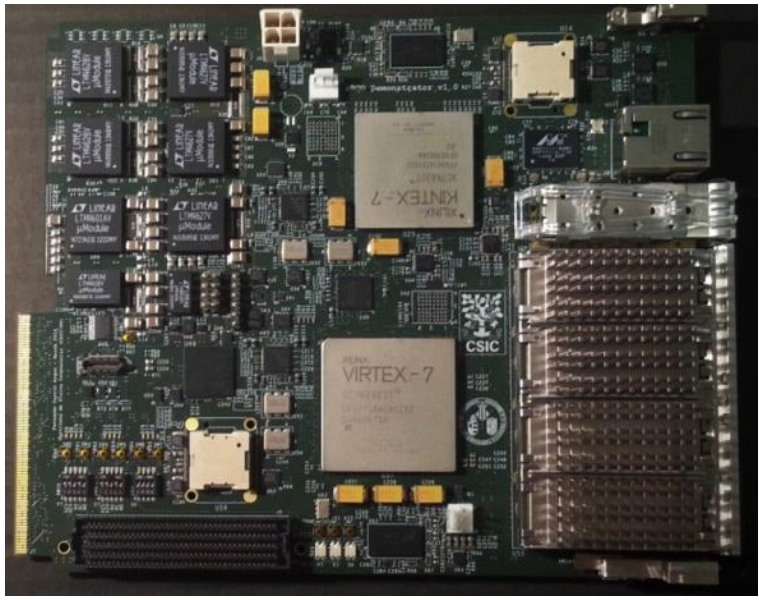
TileCal Group Operations & Upgrade

We have participated in the maintenance of TileCal front-end electronics

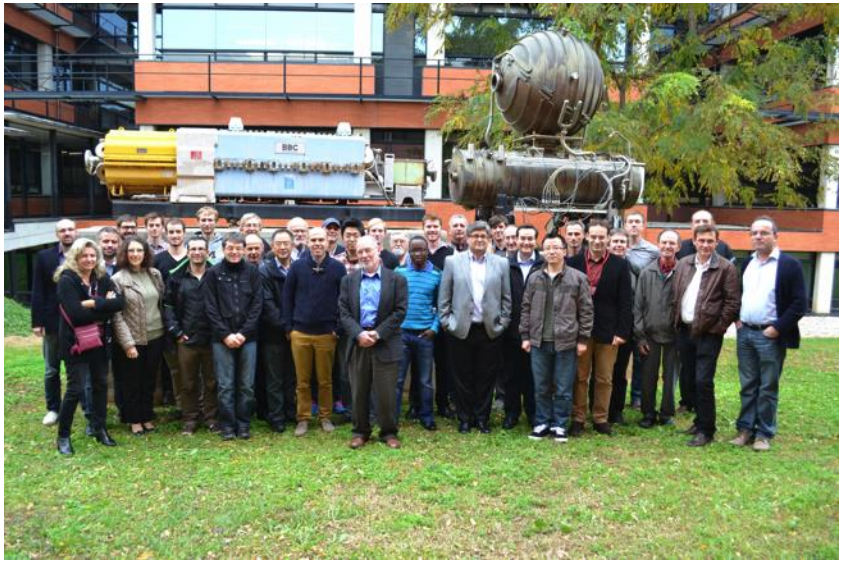
TileCal Upgrade Phase-II (2025)

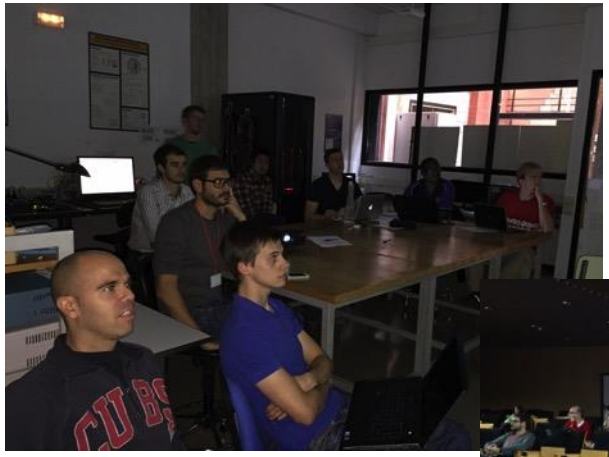
- TileCal will replace all the electronics in Phase II
- IFIC-Valencia group responsible of the design of the back-end system
- First prototypes for a demonstrator are being evaluated
  - First prototype of sROD modules designed by our group

sROD demonstrator



TileCal Upgrade Workshop



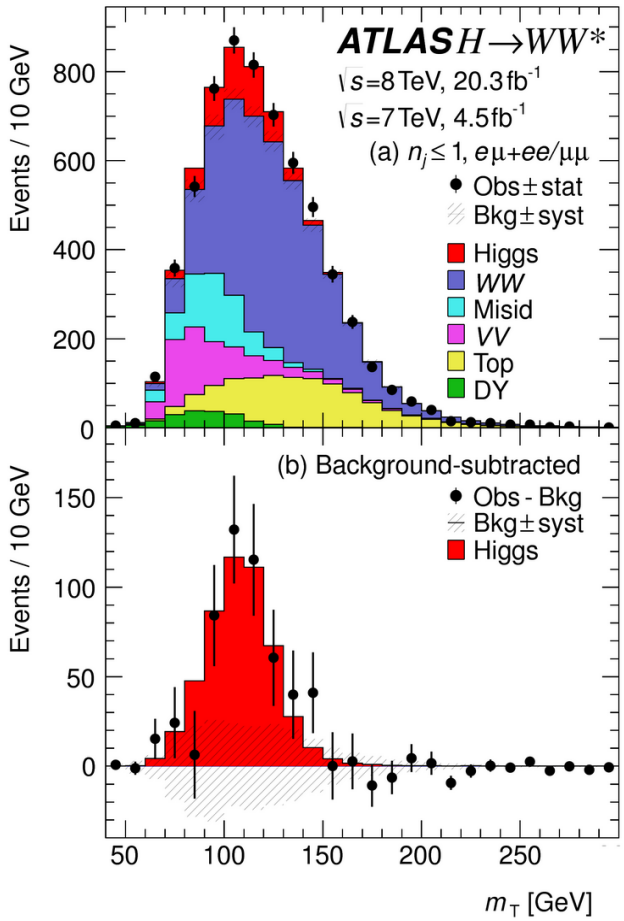


Higgs Physics

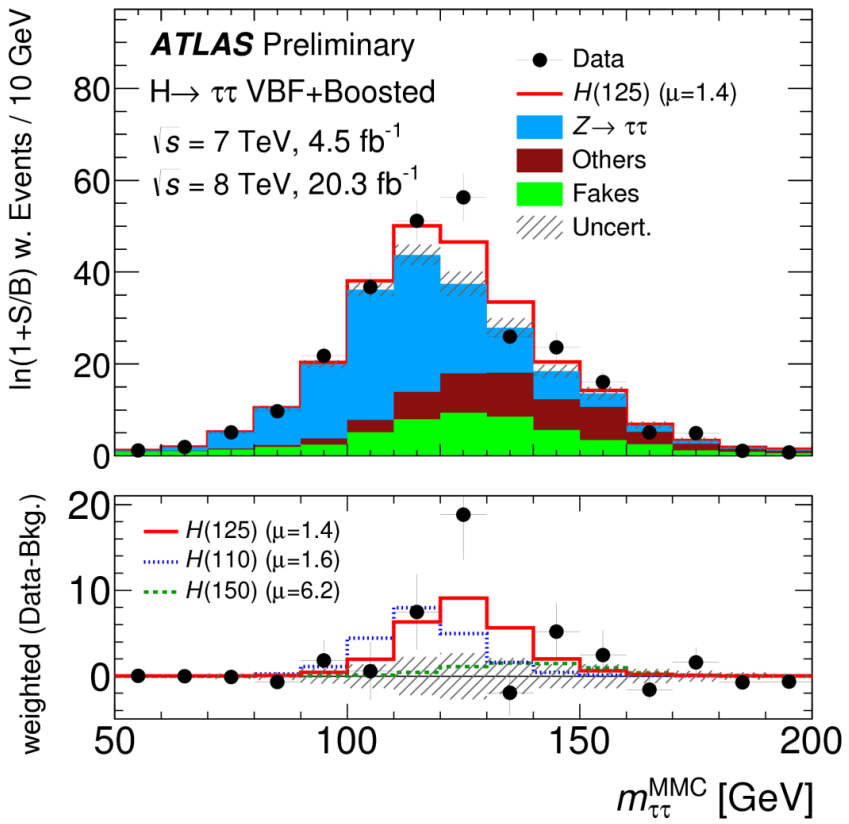
ATLAS results with full Run-1 statistics released

- Observation of H → WW* decay:
  6.1 σ excess observed @125.36 GeV
- Strong evidence of H → ττ decay:
  4.5 σ excess observed @125.36 GeV

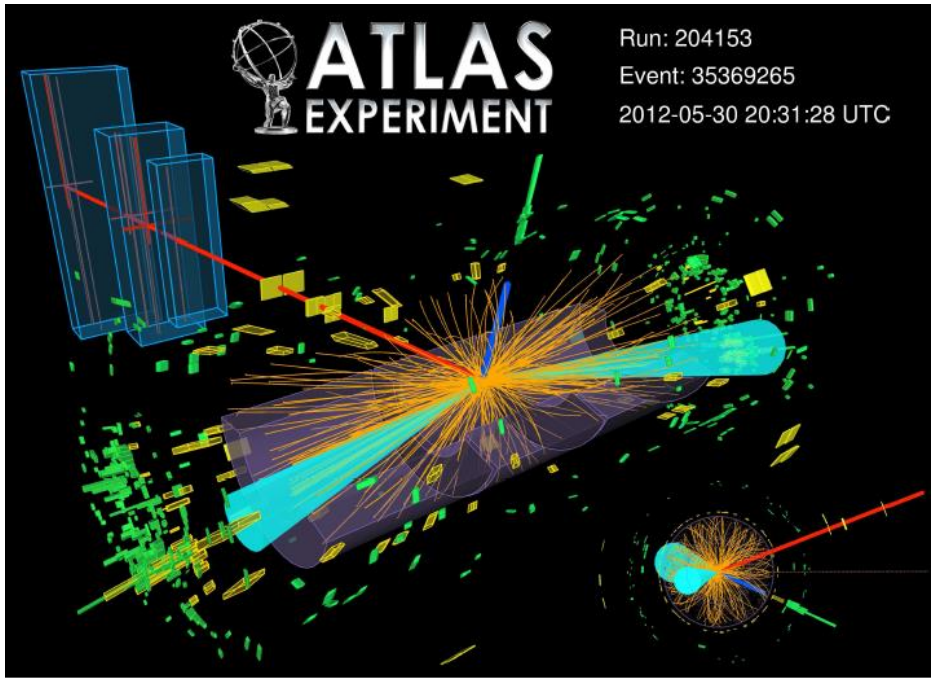
arxiv:1412.2641



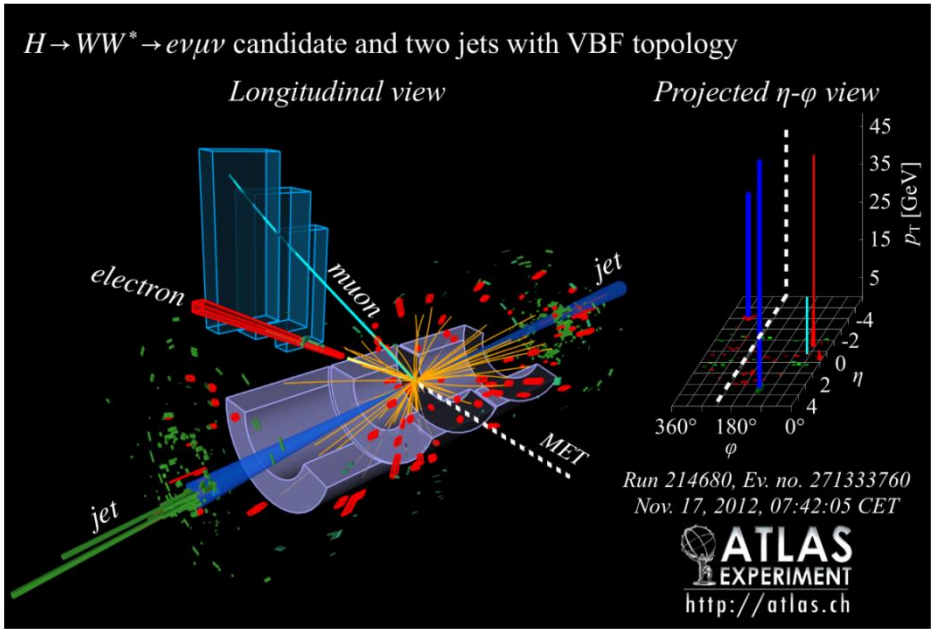
ATLAS-CONF-2014-061



Event Displays



H → τ τ decay candidate



H → WW* decay candidate

LHCb + BaBar

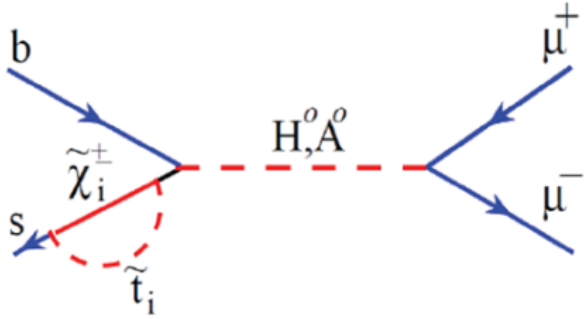
LHCb@IFIC

- **Members**

SENIOR	Fernando Martínez-Vidal Arantza Oyanguren Campos	Profesor Titular UV RyC, UV
ENGINEERS	José Mazorra de Cos	TEC Prometeo, UV
PHD STUDENTS	Pablo Ruiz Valls Carlos Sánchez Mayordomo	PIF Prometeo, UV Contratado, UV
MD STUDENTS	Clara Remón Alepuz	

- **Scientific goals**

Indirect searches for new physics through precision measurements **Particles created *off-shell***
Evidence in quantum effects (loops) *(BR's, asymmetries…)*



- **Projects**

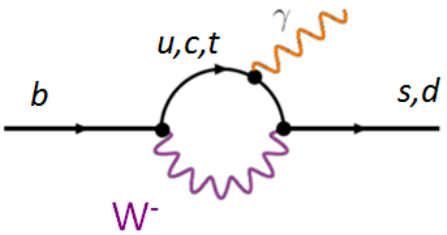
GVPROMETEOII/2014/049	Aproximación teórico-experimental a la búsqueda de nueva física con sabores pesados	IP: F.J. Botella Olcina
FPA2013-48020-C3-2-P	Participación española en el experimento LHCb del CERN: Física y mejoras	

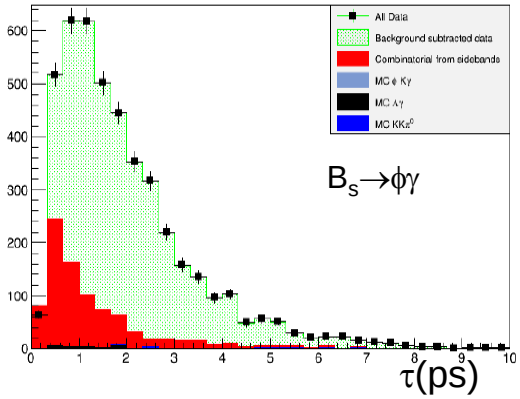
Photon polarization in $B_s \rightarrow \phi\gamma$ decays

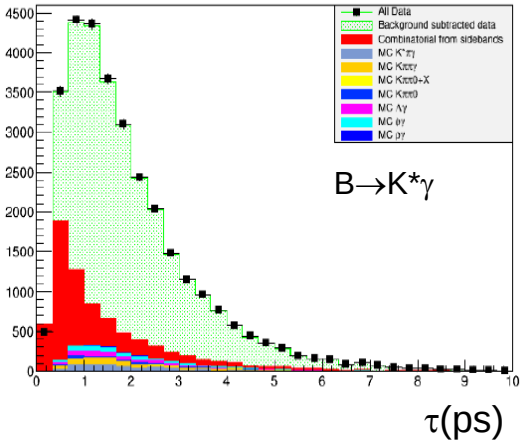
→ Photons in ***b →s*** decays are predicted to be left-handed in the SM (small corrections of order m_s/m_b)

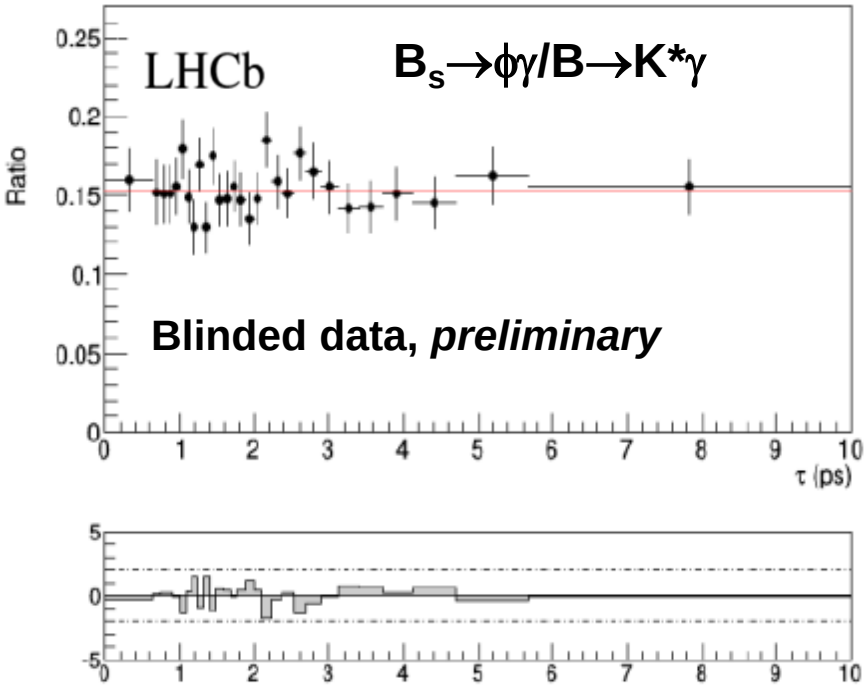
→ Very sensitive to new physics models, particularly **Left-Right Symmetrlc Models**

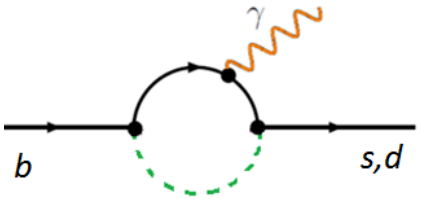
→ A medium-long term milestone of the LHCb physics program

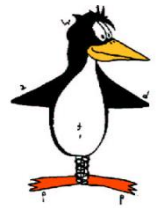












LHCb-ANA-2014-102, presented last week at the LHCb week. First results aiming at Moriond

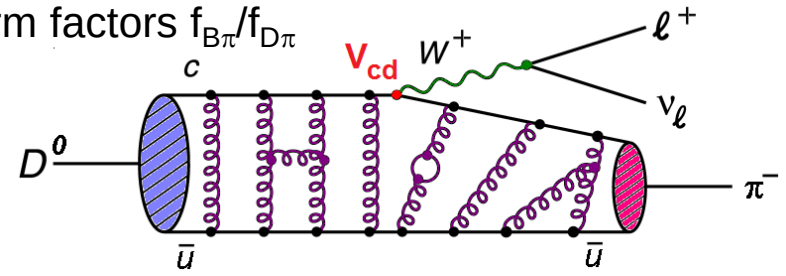
Form factors, Lattice QCD and |Vub|

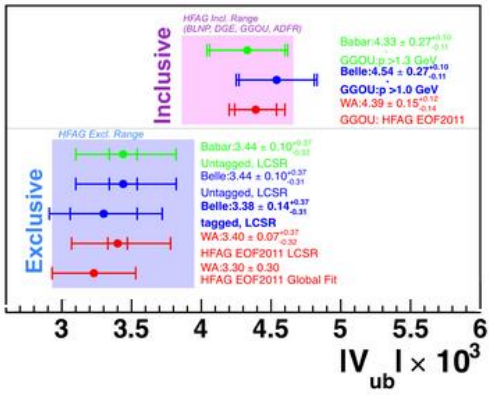
Finalizing BaBar activities:

Precise determination of the form factor in D $\rightarrow \pi e \nu$ transitions

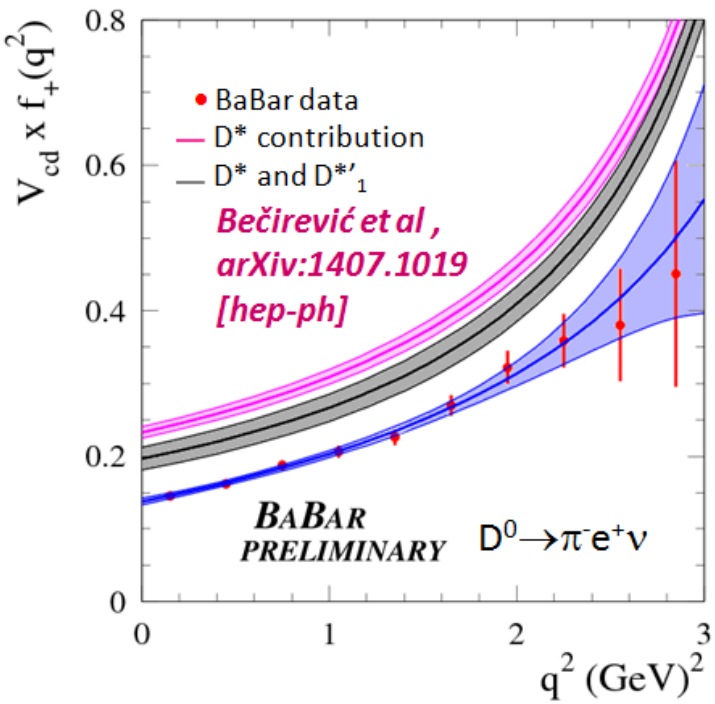
$\rightarrow$ Validate Lattice QCD computations

$\rightarrow$ Alternative determination of $|V_{ub}|$ using the ratio of form factors $f_{B\pi}/f_{D\pi}$

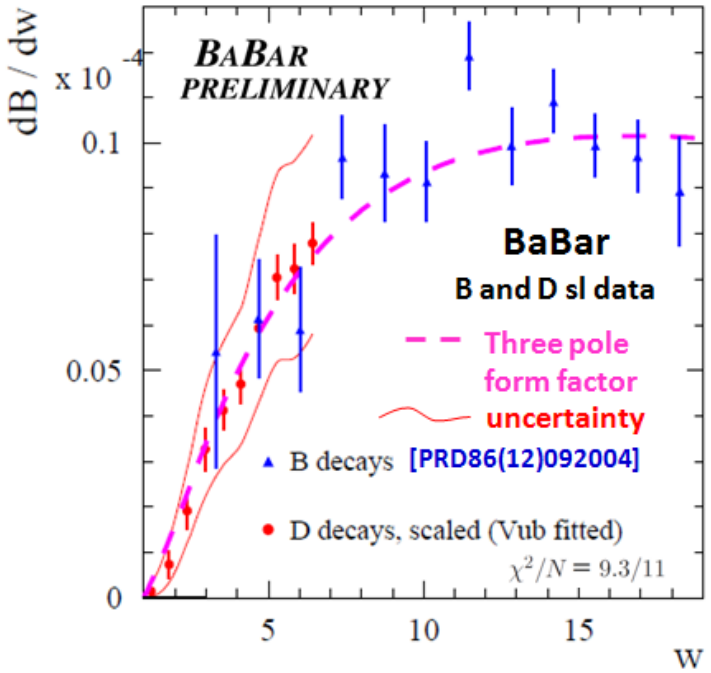




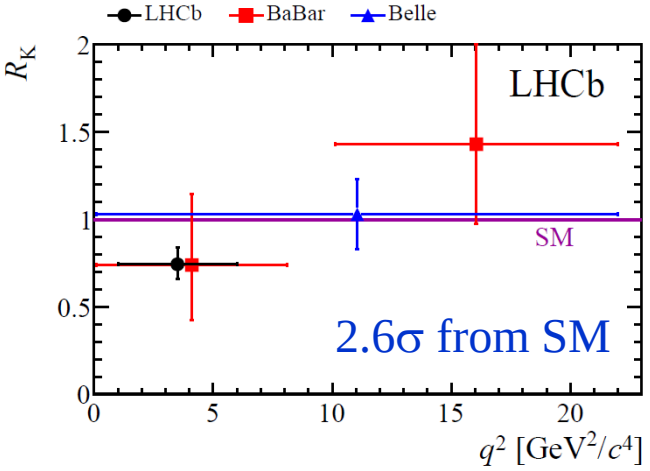
More than 2σ discrepancy

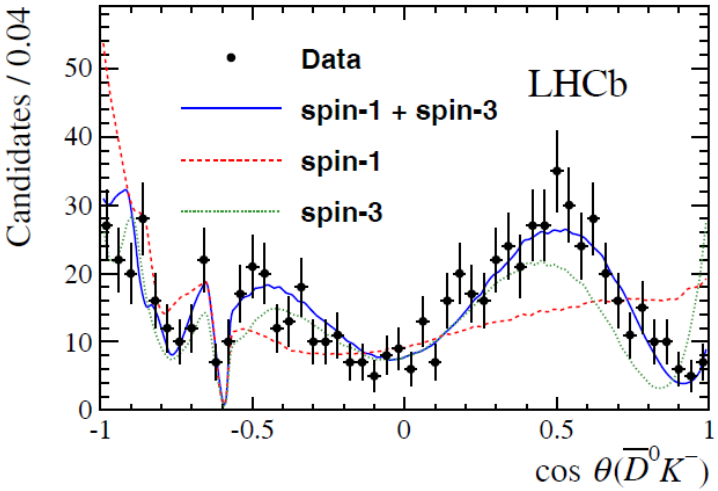


Submitted to Phys. Rev. D



Other Physics Highlights of the group

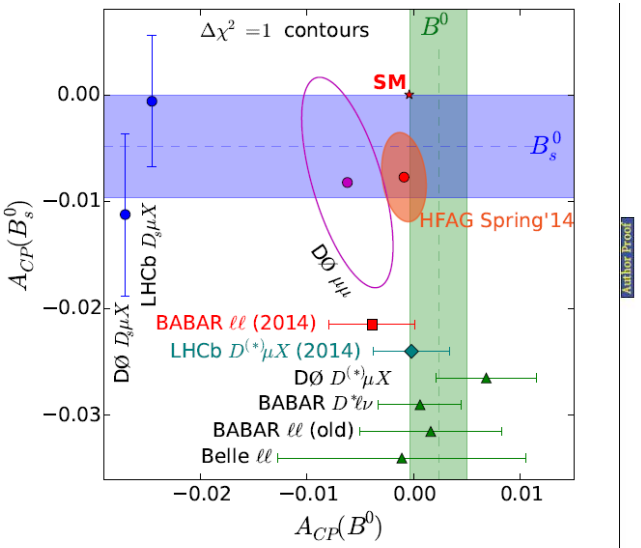




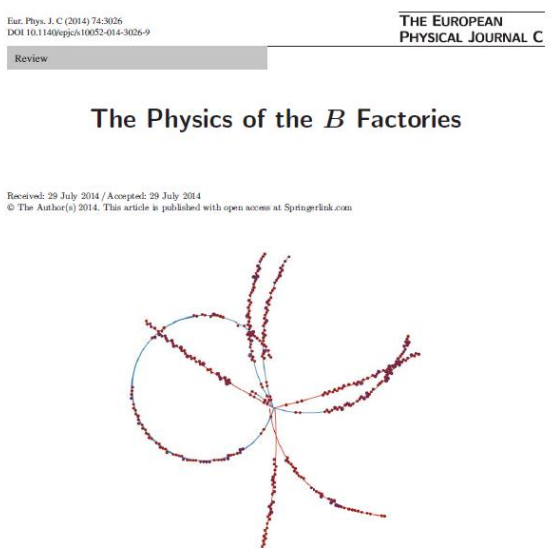
First observation of a spin-3 heavy flavor resonance. Phys. Rev. Lett. 113 (2014) 162001. Phys. Rev. D90 (2014) 072003.

Lepton Universality breaking?
Ratio of $B^+ \to K^+ \mu\mu$ to $B^+ \to K^+ ee$.
Phys. Rev. Lett. 113 (2014) 151601.

50 Years of CP violation, Queen Mary-University of London



CP asymmetry in B0-B0 mixing with inclusive leptons. Submitted to Phys. Rev. Lett.

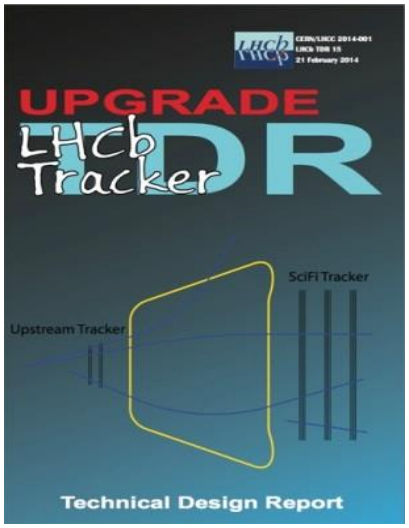


Writing and section editor of *The Physics of the B Factories* book

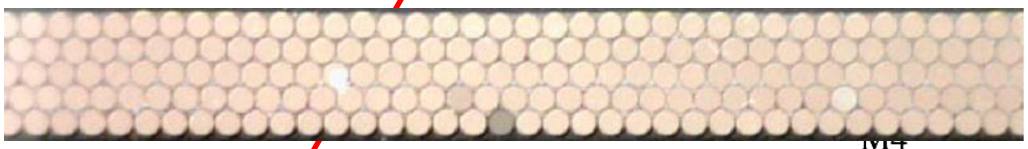
Roles of the group: Heavy Flavour Averaging Group (HFAG), LHCb stripping liason, BaBar Publication Board, LHC and BaBar review committees

LHCb detector Upgrade

- Aiming to increase x10 in statistics after 2018 shutdown (lumi ~2×10^{33} $cm^{-2}s^{-1}$)
- Readout all the detector at 40 MHz
  - ⇒ Most electronics to be replaced
  - ⇒ Run high level (flexible) trigger on all events
  - ⇒ Tracking detectors to be replaced:
- IFIC involved in FE ASIC (PACIFIC) for readout of the **Scintillating Fiber (SciFi).**
  Will replace outer straw tubes and inner micro-strips.
  In collaboration with ICC-UV, LPC-UBP and PIH-RKUH.



SciFi

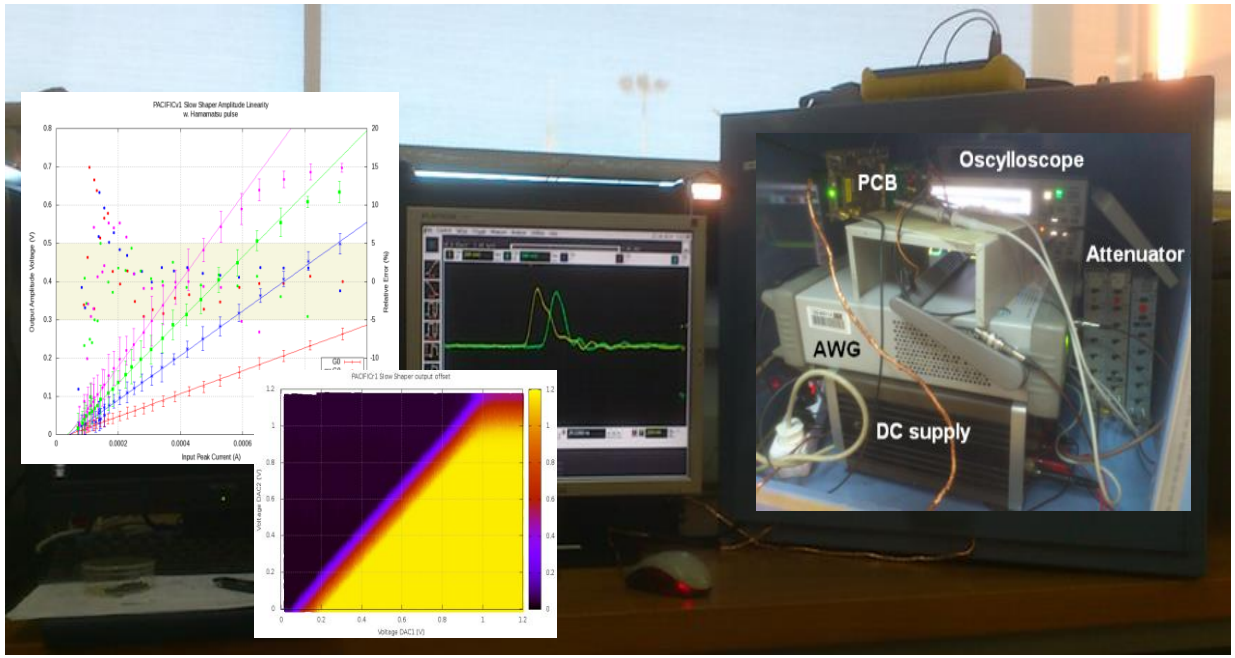


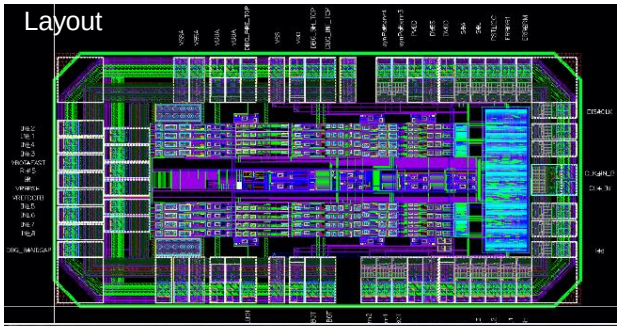
LHCb detector Upgrade (cont'd)

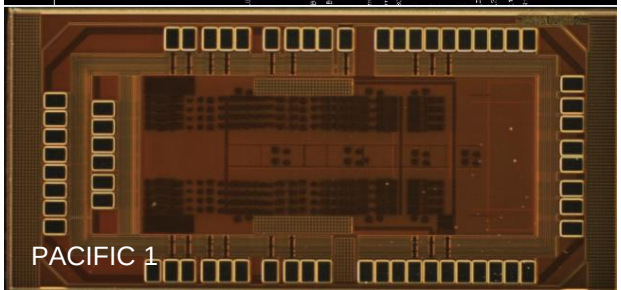
- Contribution to the design, characterization and test of 1st PACIFIC prototype ⇒ functionalities match design

- 2nd prototype designed in 2014, fabricated this fall. Characterization and test to be performed in the coming months. To be ready for next ASIC review (2/2015).

Setup@IFIC (Electronics Workshop)







- 3rd PACIFIC prototype under design. Fabrication expected in March 2015. Will participate in characterization and test.

GRID

Grupo de Computación GRID y e-Ciencia (G2C2E)

Group of GRID & e-Science

Resumen para la Reunión General del IFIC – 18 Diciembre 2014

Members:

Permanent staff:

A. Fernández Casani	:	Titulado Superior Informática- CSIC
S. González de la Hoz	:	Profesor Titular – UVEG
J. F. Salt Cairols,	:	Profesor Investigación - CSIC
J. Sánchez Martínez	:	Titulado Superior Informática- CSIC

Contract staff :

V. Lacort Pellicer	Contratado Proyecto, CSIC
P. Briongos Rabadán*	Contratado Proyecto, CSIC (*:fin contrato en 2014)
M. Kaci*:	Contrato Proyecto, CSIC (*:fin contrato en 2014)

Ph D :

V. Sánchez Martínez:	Becario FPI (proy. SCT) , CSIC

External Collaborators:

G. Amorós Vicente:	Técnico Especialista en la AEMET (Agencia Española de Meteorología)
F. Fassi Imlahi	Profesora Física Universidad Mohammed V (Rabat)
Miguel Villaplana	Postdoc en INFN-Milán

ATLAS Tier-2 Infrastructure :

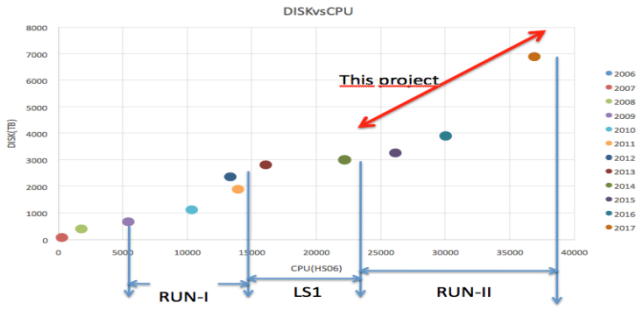
- each year our Tier-2 has to provide The pledged computing and data storage For the whole ATLAS Collaboration resources

-Funded by the HEP Spanish Program

Evolution of the Tier-2 Resources

T2-ES	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
CPU(HS06)	92	243	1750	5390	10308	13900	13300	18000	20600	26100	30000	36875
DISK(TB)	14	63	387	656	1107	1880	2350	2550	2800	3250	3900	6875

Profile resource growth in the period 2006-2017



FPA2013 Project:
-FAX: - Federated Data Storage System
- Expert System:
- User Support
- Cloud Computing
- Distributed Analysis

A 'pure' R&D Computing Activity

Event Index

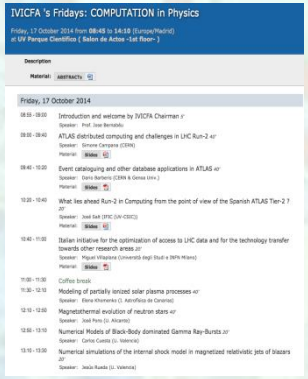
(since April 2013)

-Development & deployment of a catalogue of events with large amounts of data
-To reach good performance
- Based on NoSQL technology
Important Contribution from ES_ATLAS_T2
- Contribution to Distributed Data Collection of the Event Index Information

It is a recognition of the experience gained in ATLAS
- **15th December: it is already diestributed in ATLAS Software Releases**

Contributions to Conferences/ Workshop Organization

- **IVICFA's Friday: Computation in Physics – 17th October 2014**
- **IBERGRID 2014**
- **Workshop**



IFIC site/Spanish ATLAS T2: a reference site

Reference site for others centers willing to be a T2
- **Algerian center (CERIST)**
- **South Africa**
- **Georgia**
- **…**

Scientific Applications migrated/supported in GRID at IFIC

Astroparticle	Nuclear Physics	Theroetical Physics	Medical Physics	Experimental High Energy Physics
ANTARES	AGATA ADVANCED GAMMA TRACKING ARRAY	Lattice QCD	PARTNER	ATLAS TIER2 SPAIN
T2K		Beyond the Standard Model	Medical Image	ID Alignment
KM3NeT Opens a new window on our universe			ENVISION Project	EventIndex
			Simulation In M.P. (GRID)	Physics Analysis
				ilc international linear collider

Université Mohammed V Agdal — Faculté des Sciences Rabat

GOBIERNO DE ESPAÑA — MINISTERIO DE ASUNTOS EXTERIORES Y DE COOPERACIÓN — aecid

Futuros colisionadores

I+D de detector y estudios de física para futuros colisionadores

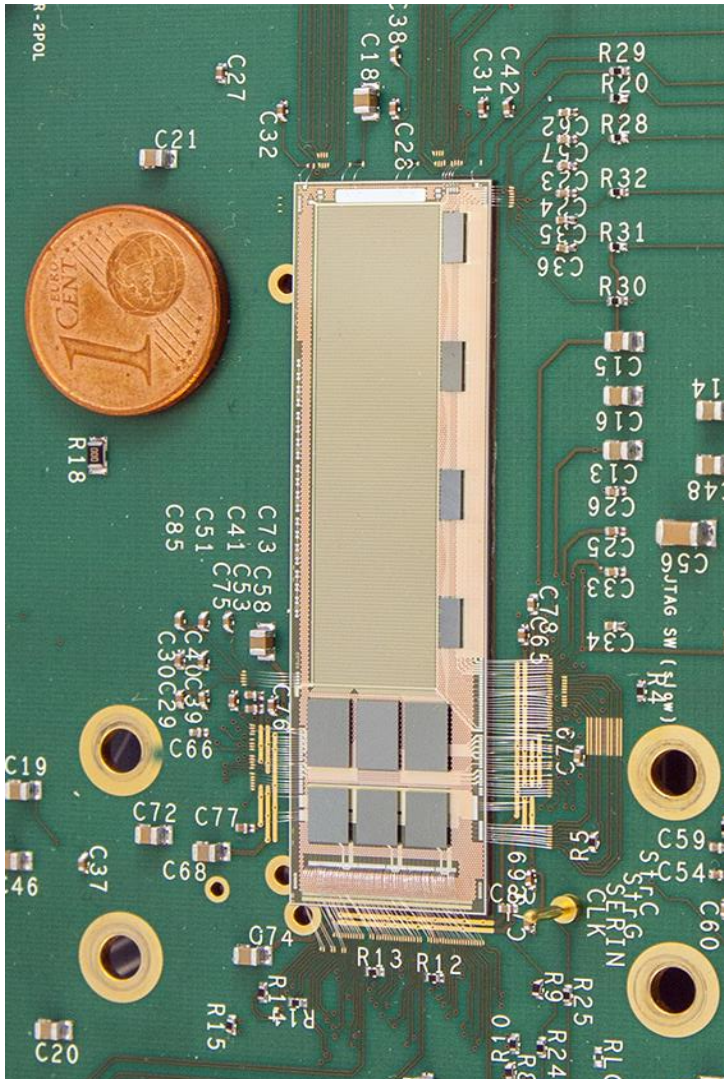
J. Fuster, C. Lacasta, E. Ros, M. Vos
M. Boronat (PhD), I. Garcia (PhD),
M.A. Villarejo (Eng.)

Detectores

detectores de píxeles activos DEPFET (www.depfet.org)

- **La próxima generación de detectores:**
  - Resolución: 3 μm
  - Espesor: 50 μm

- **Detectores de vértices DEPFET:**
  - Prototipo completo en haz en Enero 2014
  - Entrega PXD a Belle II ~2016
  - Candidato solido para ILC



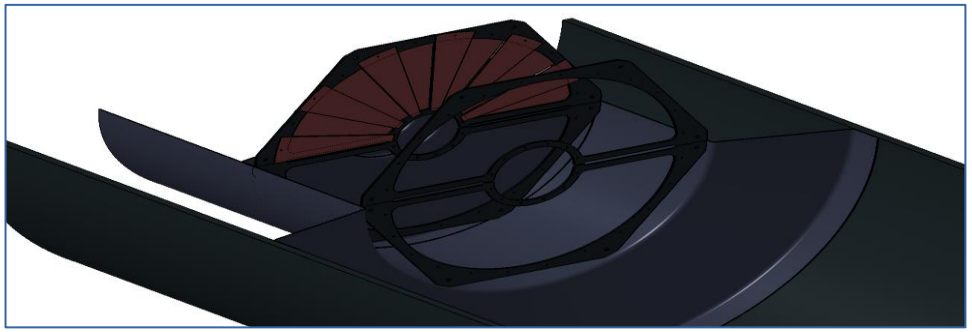
C. Lacasta, Institute Board chair
M. Vos, contacto con Linear Collider

Physical limitations to the spatial resolution of solid-state detectors, arXiv:1404.4535 (acc. IEEE TNS)

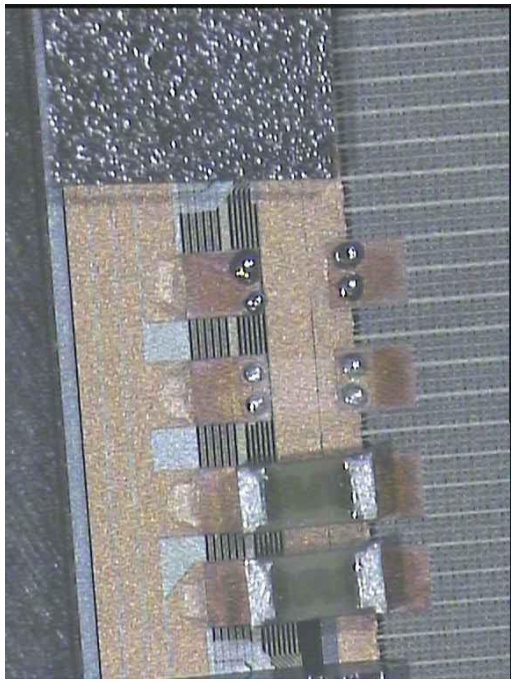
ECFA R&D review, DESY, Junio 2014

DEPFET para Belle II e ILC

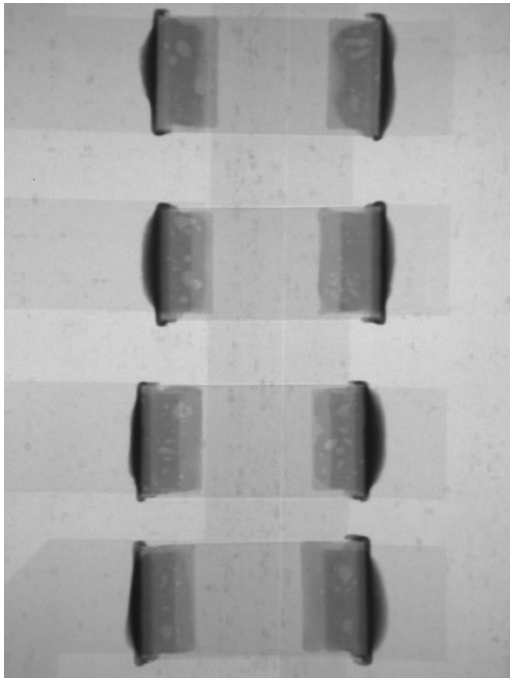
IFIC y NTC colaboran en la producción del detector de vértices de Belle II
Conexión componentes pasivos
QA, test de recepción modulos



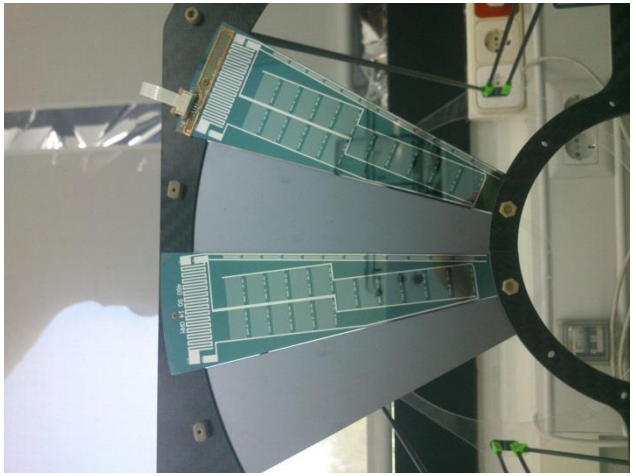
Interconexión sensor-componentes (NTC)



Radiografía, test de calidad (IFIC)



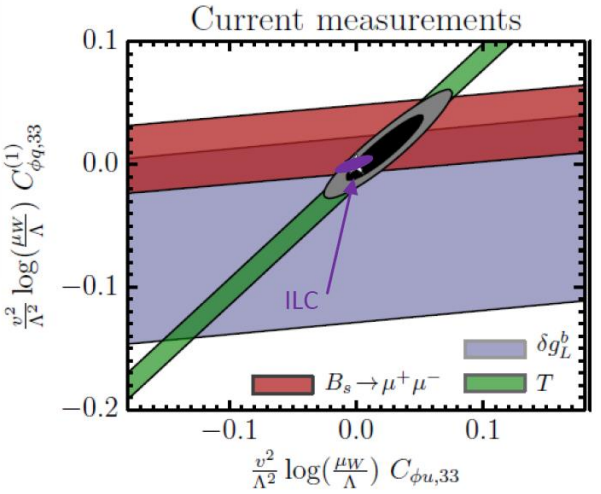
IFIC se encarga del diseño del detector hacia delante de ILC



maqueta end-cap para ILC

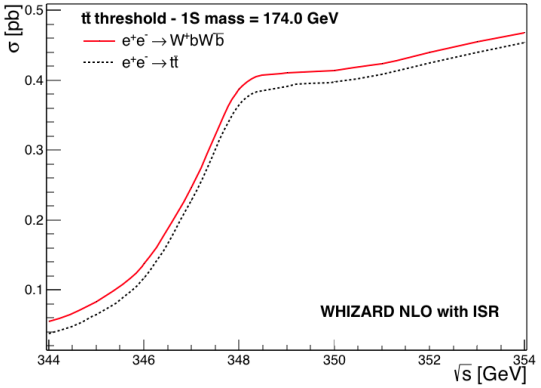
J. Fuster,
European chair LC physics & detector,
Chair of C11 of IUPAP – particles & fields
Editor ILC TDR – volume 4

Física



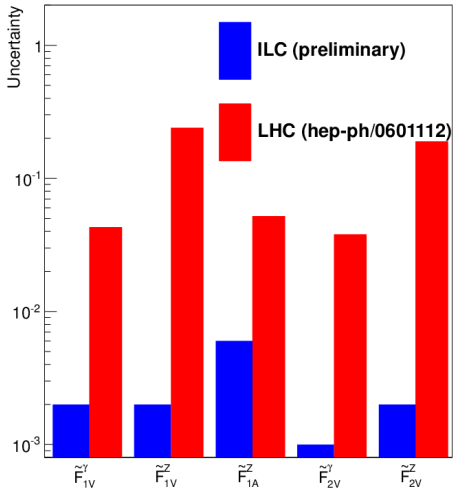
Estudios de la física del quark top estableciendo el potencial de un futuro LC para la medida de la masa del quark y sus acoplamientos electro-debiles

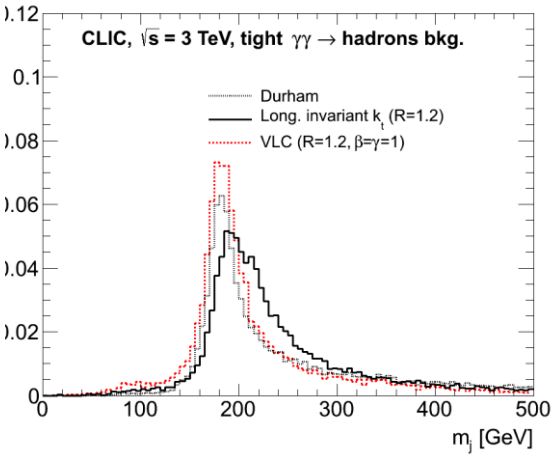
- ILC TDR, Volume 4, detectors, arXiv:1306.6329
- Constantes fundamentales, arXiv:1405.4781
- Single top, arXiv:1411.2355
- Masa del top, EPJC74 (2014) 10, 3119
- Acoplamientos ttZ, ttg, arXiv:1307.8102
- Snowmass top WG, arXiv:1311.2028



Estudios de jets

- El algoritmo VLC, arXiv:1404.4294





FÍSICA NUCLEAR

Espectroscopía gamma y de neutrones

Memoria del Grupo de Espectroscopia Gamma y de Neutrones 2014

Miembros del grupo :

Dr. Berta Rubio (Prof.)
Dr. Jose Luis Taín (Inv. Cient)
Dr. Alejandro Algora (Cient. Tit.)
Dr. Cesar Domingo (RyC)
Dr. Sonja Orrigo (Postdoc)
Jorge Agramunt (Ing. Cont.)
Ariel Tarifeño (Postdoc)
Ela Ganioglu (Postdoc)
Ana Montaner (Est. doc.)
Victor Guadilla (Est. doc.)

Otros colaboradores:

William Gelletly (Prof.)
Enrique Nácher (Tit. Sup.)
Ebhelixes Valencia (Est. doc.)
Dr. Dolores Jordan (Postdoc)

Financiación actual:

FPA: FPA 2011-24553
NUPNET: PRI-PIMNUP-2011-1348
ESFRI: AIC-A-2011-0696
IP Alejandro Algora

Proyecto de Colaboración con ENRESA
IP Cesar Domingo, Berta Rubio

En progreso una nueva solicitud de **proyecto FPA (IP: A. Algora)** por tres años, y un **ERC-grant (C. Domingo)** que ha pasado la primera fase

Colaboraciones:

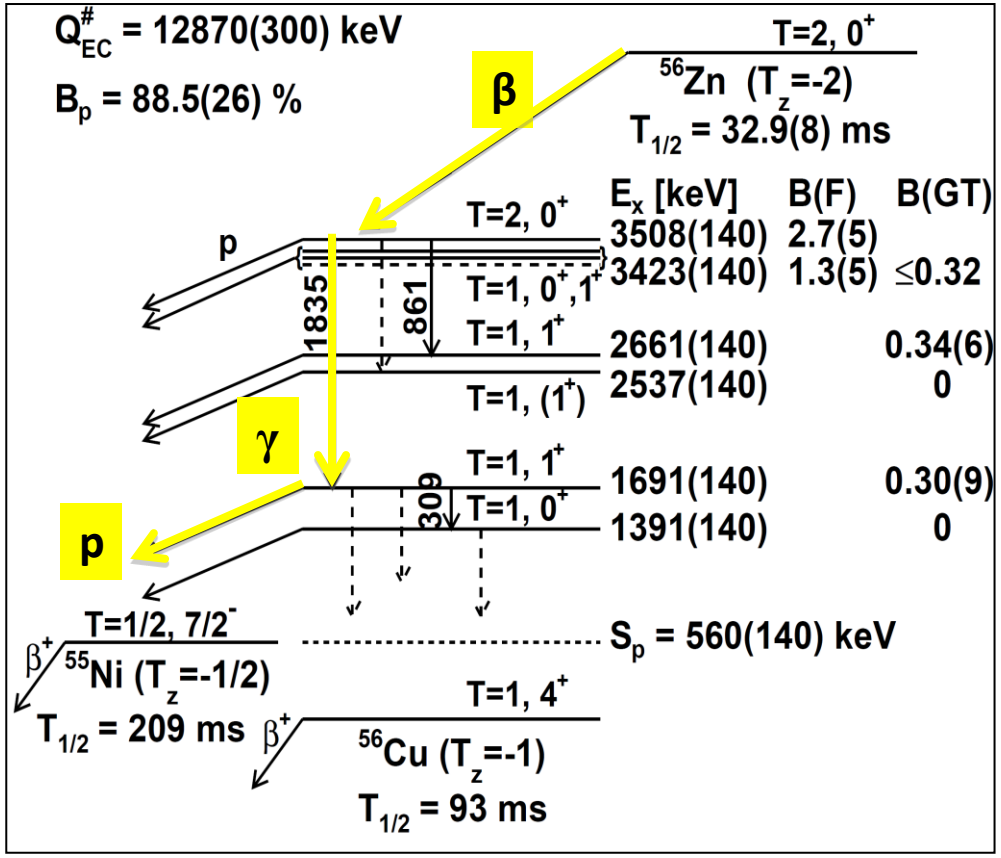
GSI (Alemania), RCNP(Japon), RIKEN (Japon), GANIL (Francia), Univ. Surrey (UK), Univ. Jyväskylä (Finlandia), Subatech (Francia), ATOMKI (Hungría), CIEMAT (España), UPC (España), etc.


A picture is worth a thousand words (Chinese proverb?)

Observación de la desintegración exótica beta-gamma-proton en ^{56}Zn

Se ha observado por primera vez la desintegracion beta seguida de emisión gamma seguida de la emisión de un proton (secuencia temporal: beta-gamma-p) en la capa fp (y por segunda vez en la tabla completa de núclidos). Esta desintegración exótica afecta la manera convencional de determinar la B(F) y B(GT) en núcleos ricos en protones y demuestra la necesidad de la detección gamma en este tipo de estudios.

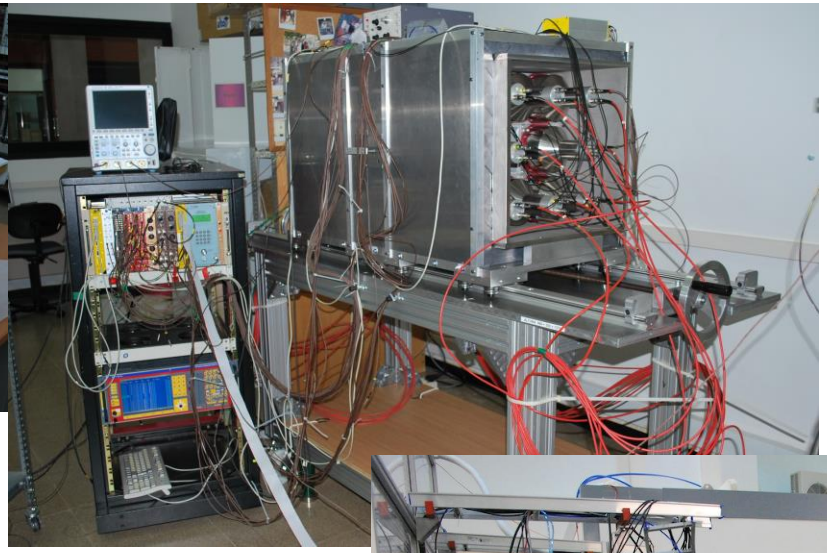
Publicación: **Sonja Orrigo** et al. PRL 112
Exp. spokesperson: **B. Rubio**



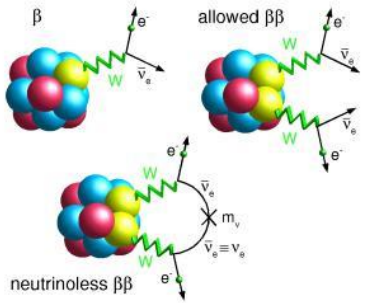
PRL 112, 222501 (2014) PHYSICAL REVIEW LETTERS week ending 6 JUNE 2014

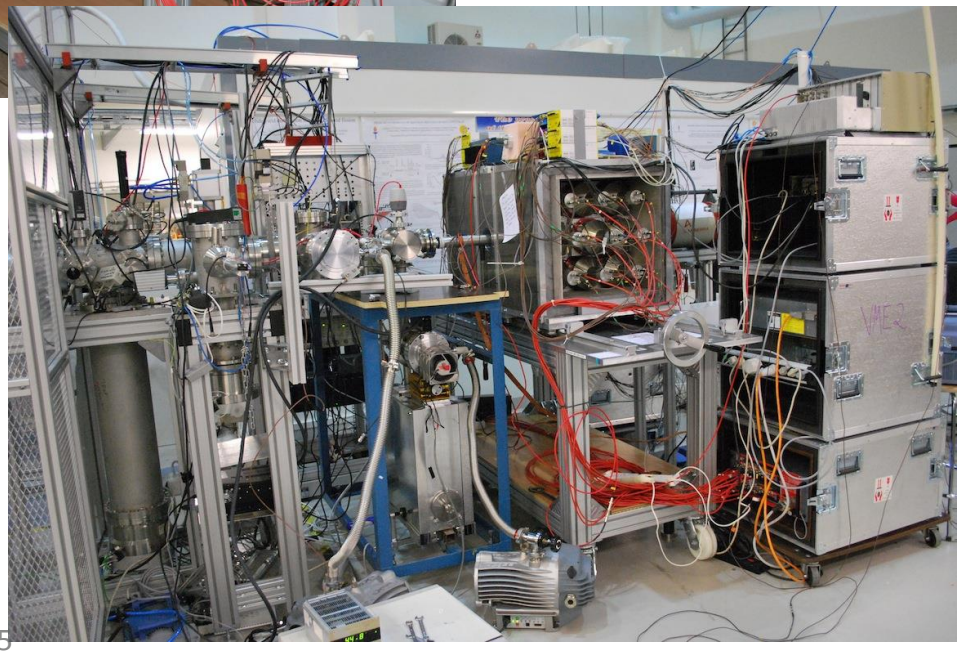
Observation of the β-Delayed γ-Proton Decay of ^{56}Zn and its Impact on the Gamow-Teller Strength Evaluation

Construcción, puesta a punto y primeros experimentos del detector DTAS



DTAS spokesperson: **JL Tain**
TDR aprobado: Nov. 2012
Const. acabada: Dic. 2013
Primer exp: Feb. 2014, en IGISOL IV





IGISOL IV, Febrero 2014
Experimento I154: TAS and double beta decay (portavoces: **A. Algora, J.L Tain**)
Experimento I153: TAS and reactor antineutrinos (portavoces: M. Fallot, **J.L Tain, A. Algora**)

JYFL Accelerator News

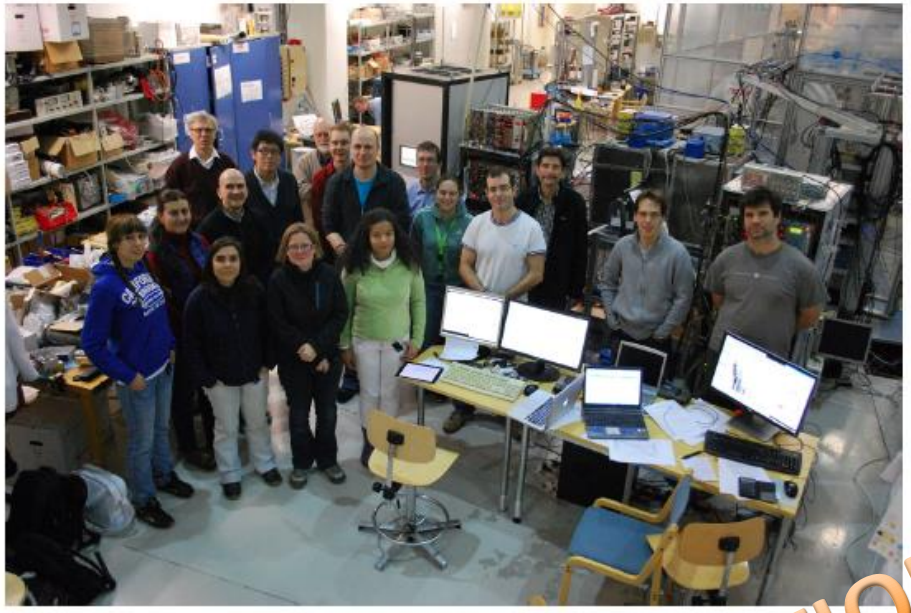
Accelerator Laboratory, Department of Physics
University of Jyväskylä, Finland

Volume 21, No. 1 February 2014

A new era of physics opportunities commences at IGISOL-4

2013 marked an impressive year in the progress of the IGISOL-4 commissioning phase. In addition to test and development time, 40 days of cyclotron beam time were used for five PAC-approved experiments. One highlight was the visit by an external group of experimenters in November/ December led Bertram Blank and his colleagues from Bordeaux. That run focused on measurements of beta-decay half-lives and branching ratios of mirror nuclei.

The coming year promises much activity and has already been a very busy time for the local group. Our colleagues from the UK saw in the first experiment of 2014 with collinear laser spectroscopy of fission fragments. Soon after, visitors from York and Aarhus, Denmark, utilized the new MCC30/15 cyclotron in a week of successful yield testing for the production of ^{12}N. In the past month, an impressive group of approximately 25 visitors mainly from Valencia in Spain, and Subatech, Nantes, in France arrived along with three tonnes of equipment. In two back-to-back experiments geared at measurements of the beta-decay strength of ^{100}Tc and a study of nuclei relevant for precise predictions of



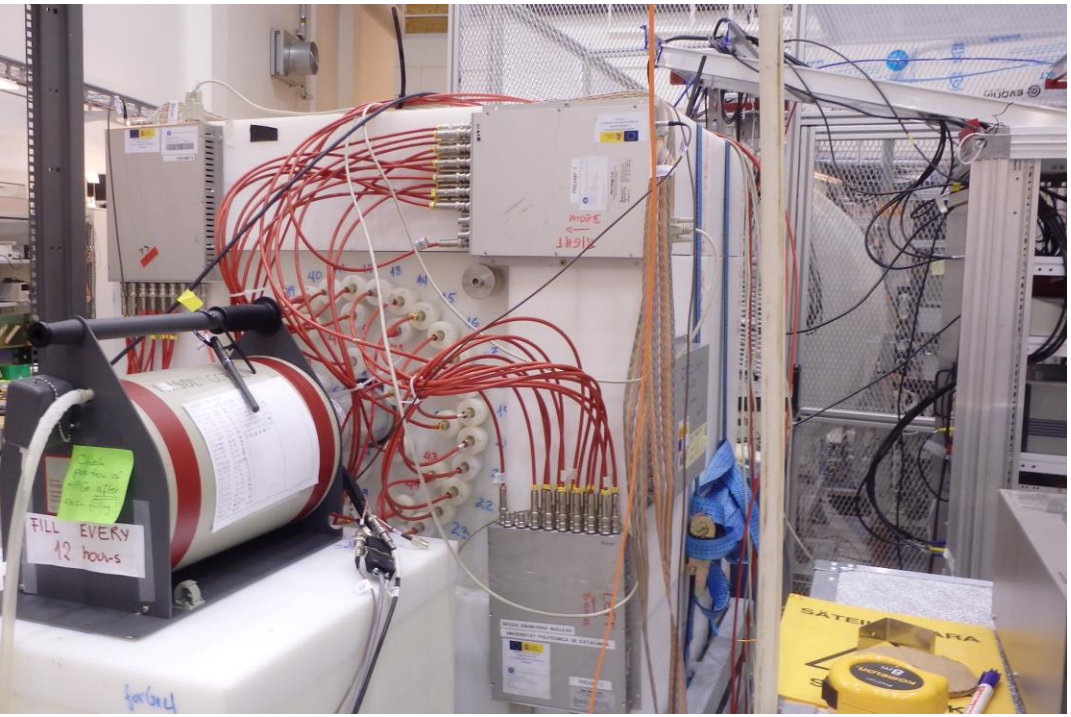
Members (current and old) of the IGISOL group along with some of our DTAS collaborators during the morning shift. JYFLTRAP can be seen in its high voltage cage in the background behind the DTAS device and related electronics. In addition, the tape station from Strasbourg is in use. Unfortunately many people who have worked hard to realize the experiment, both local and visitors, are not present.

reactor neutrino spectra, JYFLTRAP has been used to provide high purity beams for a new total absorption gamma ray spectrometer (DTAS). The latter device consists of 18 NaI crystals and has been designed to be used by the DESPEC collaboration at NUSTAR, FAIR. IGISOL-4 is therefore finally back in business!

También:
Nota CPAN
Artículo en el periódico Levante (Valencia)

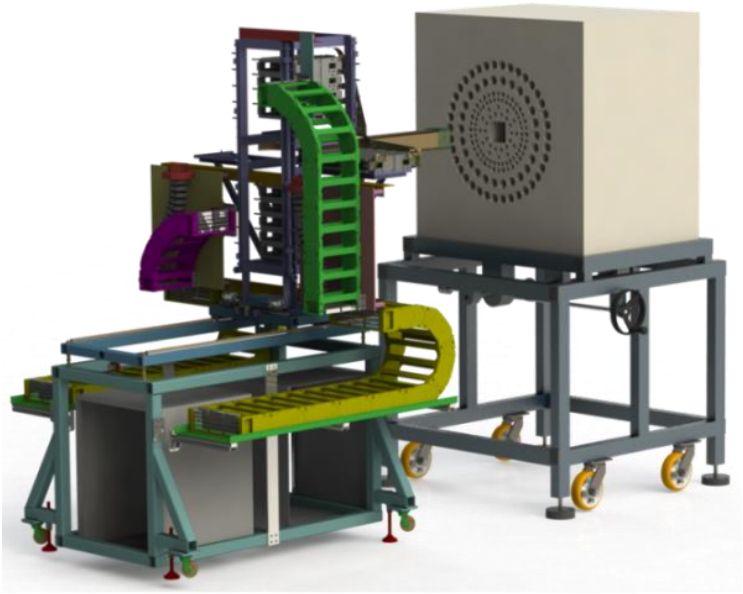
INTERNATIONAL NEWS

Primeros experimentos de BELEN en la nueva instalación IGISOL IV

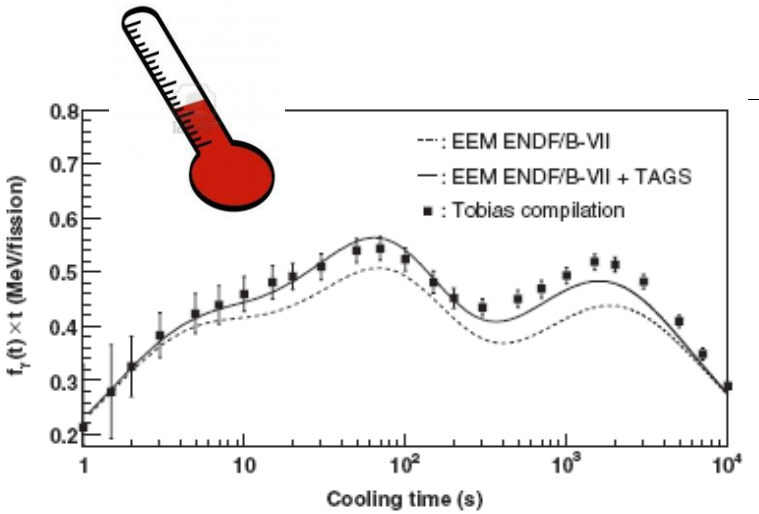


IGISOL IV, Noviembre 2014
Experimento I162: Medidas de Pn para reactores de nueva generación (portavoces: **J.L Tain, B. Hornillos**)
Experimento I181: Medidas de P1N y P2N en el núcleo 136Sb
(portavoz: **I. Dillman**)
(El papel del grupo es determinante en el funcionamiento del detector BELEN, desarrollo del DACQ, J. Agramunt)

Experimentos, que permiten preparar la futura campaña de la colaboración BRIKEN, para realizar medidas en RIKEN (Japón), colaboración que lidera el grupo (portavoz colaboración: **C. Domingo**)

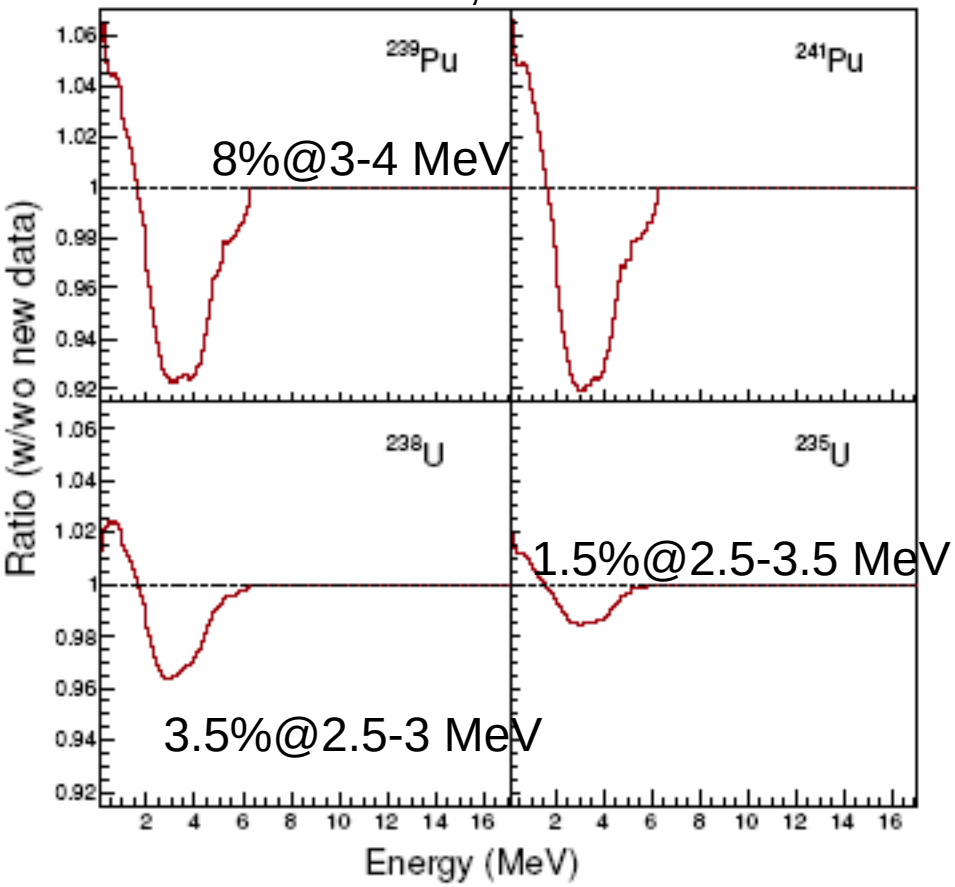


Aplicación a la fisica de los neutrinos



Dolores Jordan, PhD thesis
Algora , Jordan, Tain et al., PRL 105, 202501, 2010

M. Fallot et al., PRL 109.202504



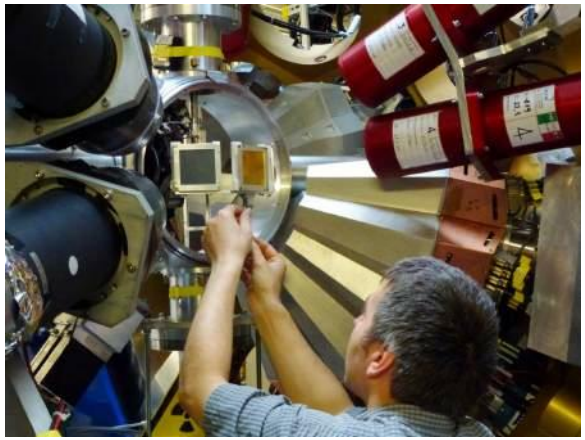
Proporción entre los espectros de antineutrinos contruidos con y sin los datos TAS de ^{102,104,105,106,107}Tc,^{105}Mo,^{101}Nb

AGATA

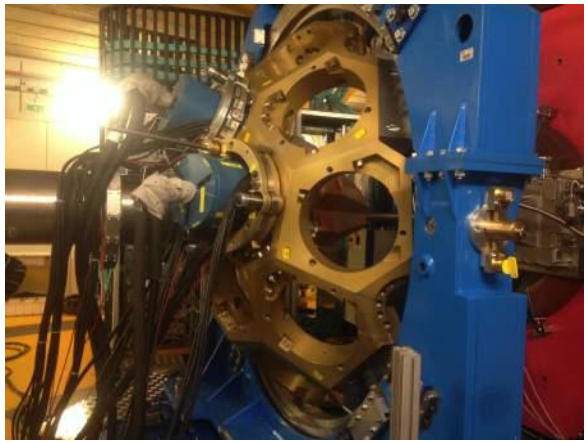
AGATA Scientific Activity

2010-2011	2012-2014	2015-2018
AGATA @ LNL	AGATA @ GSI	AGATA @ GANIL

Ya 14 publicaciones de física



Datos bajo análisis de PhD T. Hüyük



Nuevo proyecto

LNL Legnaro (Italy)	GSI (Germany)	GANIL (France)
5 triple cluster	5 double+ >5 triple cluster	15 triple cluster
Efficiencia **~6%**	Efficiencia **>10%**	Efficiencia **~20%**

2014 Group Publications:

- **3 PHYSICAL REVIEW LETTERS**
- **3 NUCLEAR INSTRUMENTS & METHODS**
- **4 PHYSICAL REVIEW C**
- **several more published or submitted**

MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD
IFIC INSTITUT DE FÍSICA CORPUSCULAR
GENERALITAT VALENCIANA
CONSELLERIA D'EDUCACIÓ, FORMACIÓ I OCUPACIÓ

AGATA ADVANCED GAMMA TRACKING ARRAY

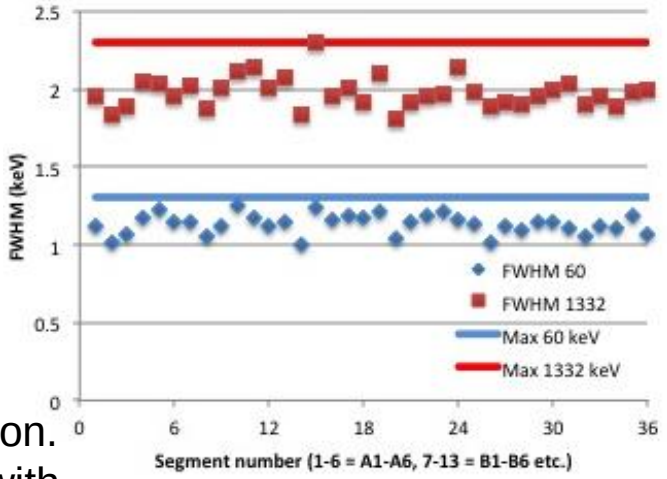
MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD

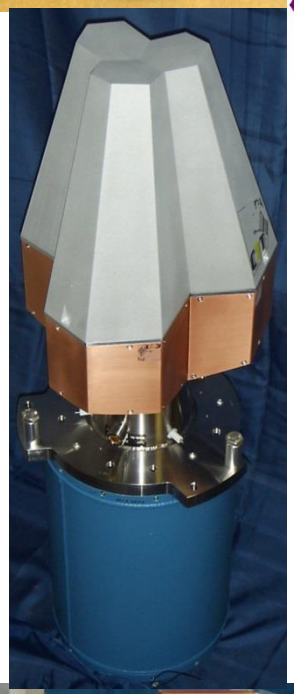
IFIC INSTITUT DE FÍSICA CORPUSCULAR

AGATA Spain: contribution to the European γ-ray Tracking Array

AGATA ADVANCED GAMMA TRACKING ARRAY

First Spanish AGATA capsule in use in the GSI setup. Second capsule delivered 18th November





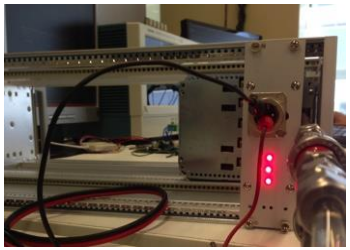
Spanish AGATA Cryostat completed to be delivered soon. Added new Ti feedthroughs with Infrastructure funds. Other AGATA infrastructures procured.

Produced 15 Control Cards for the Advanced phase 1 in Spain built; 4 full new Electronics chains, 3 for our detector and 1 for the scanning table. Design & production: IFIC In collaboration with ETSE-UVEG

mounting

ADC Card

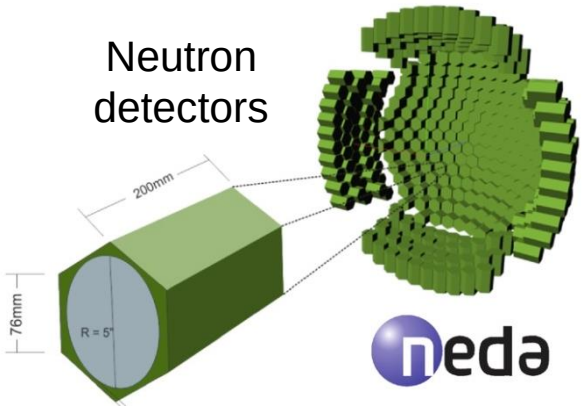
Control Card

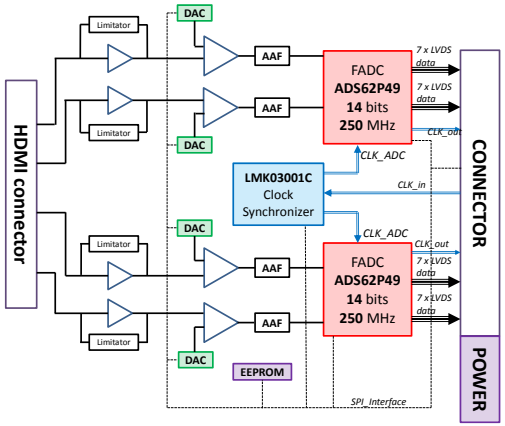


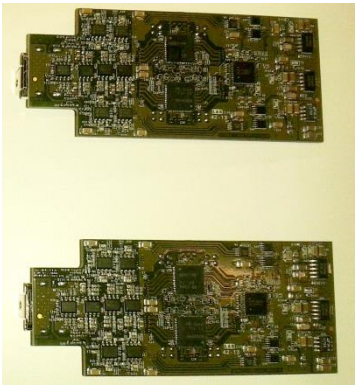
Agradecimiento a la contribución de los servicios de Mecanica y Electronica del IFIC

AGATA Spain: Complementary instrumentation, NEDA & TRACE

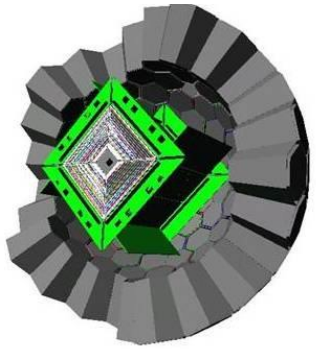
Neutron detectors



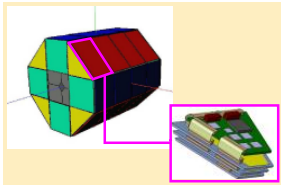


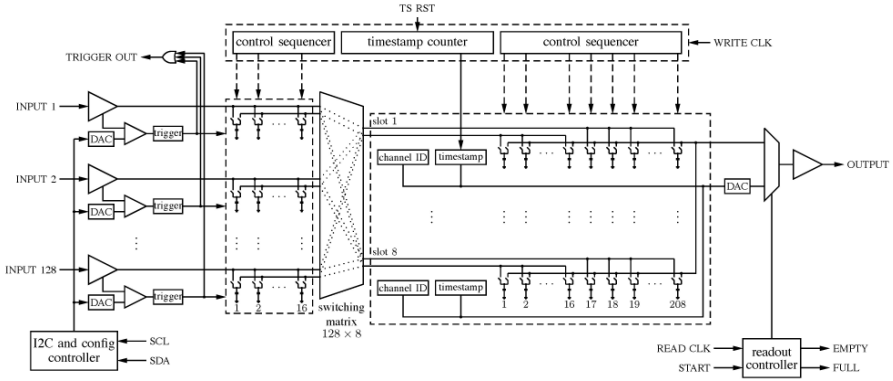


NEDA at IFIC : Conceptual Design, production of the detectors, Sampling ADC's design and production. Work performed in collaboration with ETSE-UVEG & NEDA Int. Collaboration



Charged particle detector telescopes





TRACE at IFIC : Conceptual Design, production of the detectors, Design and production of a read-out ASIC with analog buffering capability. Work performed in collaboration with I3M – UPV and ETSE – UVEG and TRACE (GTH) international Collaboration

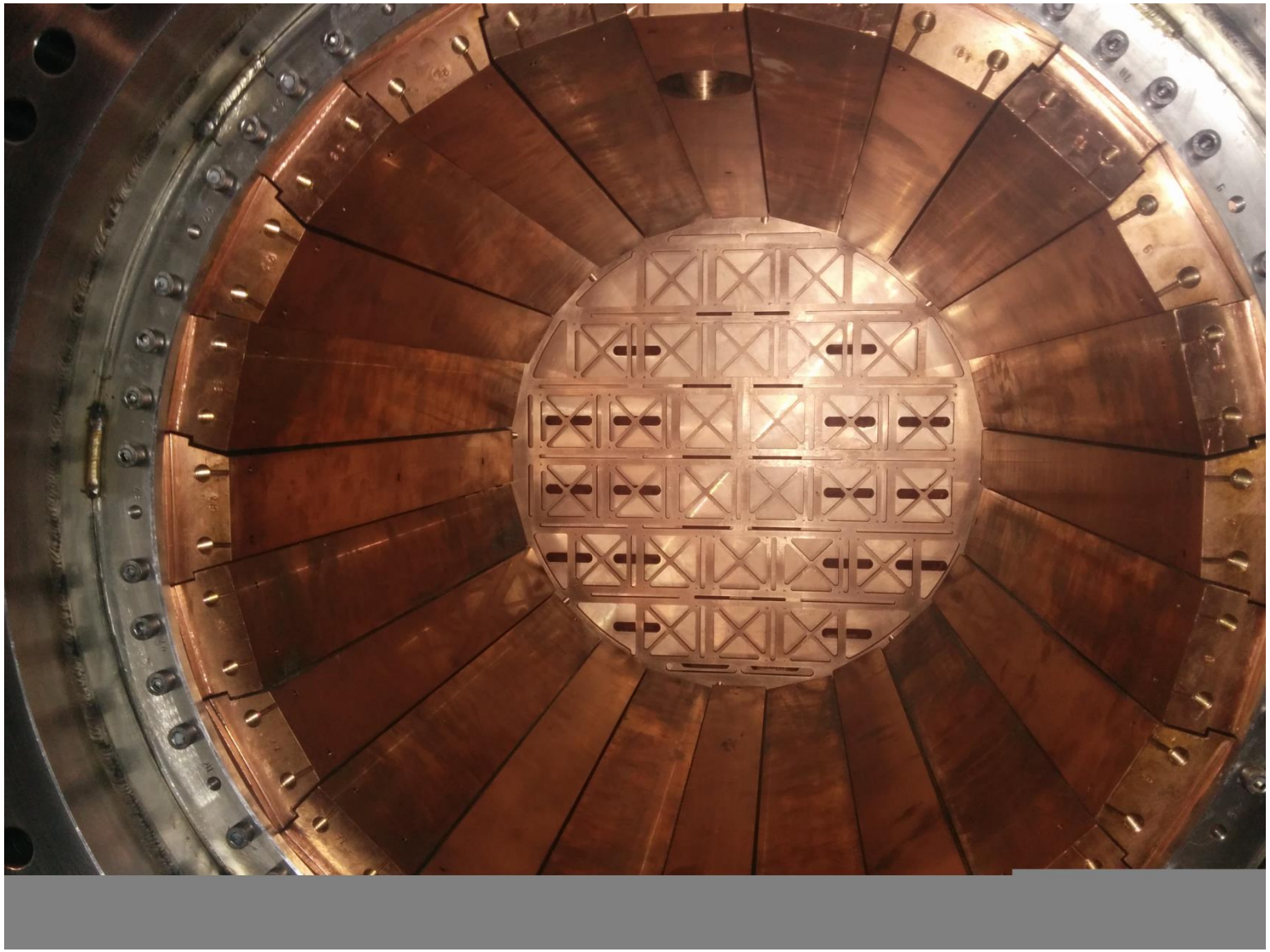
Proyecto financiado por el programa de excelencia de GVA: PROMETEO I y II

IFIC INSTITUT DE FÍSICA CORPUSCULAR

GENERALITAT VALENCIANA
CONSELLERIA D'EDUCACIÓ, FORMACIÓ I OCUPACIÓ

Neutrinos
+
Astropartículas

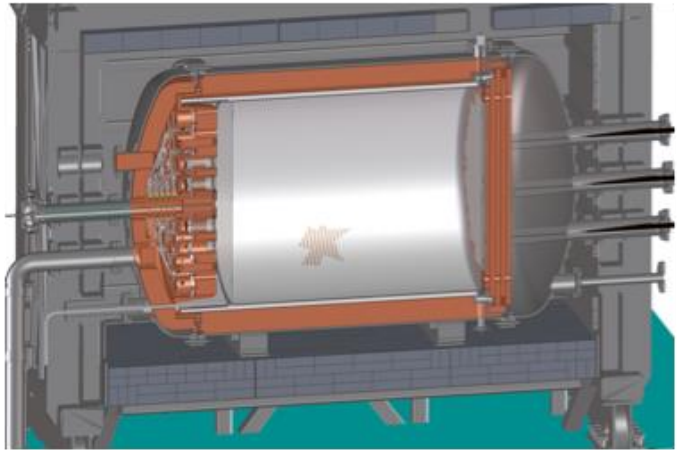
NEXT

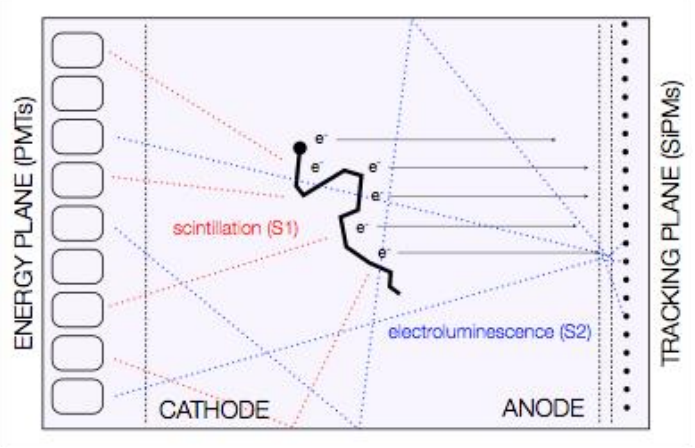


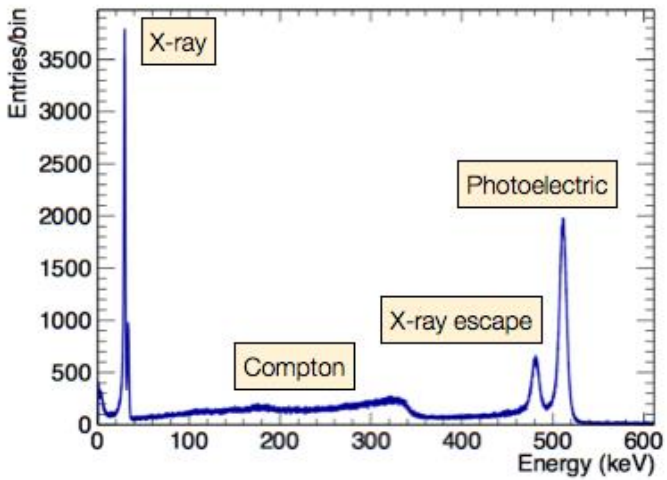
Status of the NEXT experiment

NEXT experiment

Starting in 2014







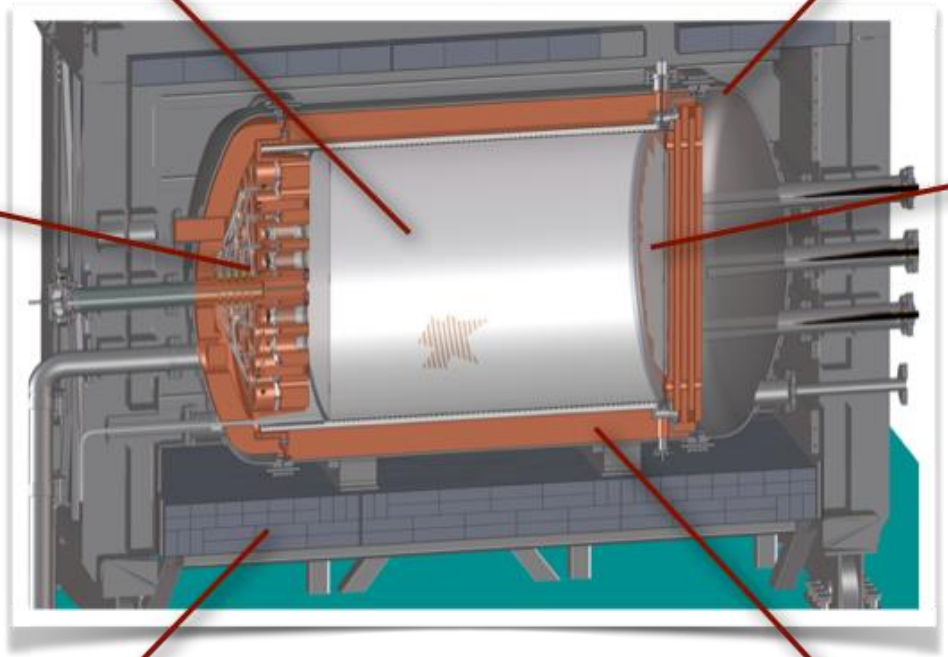
- Electroluminescent TPC with 100 kg of high-pressure ^{136}Xe gas
- Advantages: energy resolution, image electron tracks
- **2008-2013**: R&D phase with 1 kg-scale prototypes
- **2014-2016**: 10 kg detector at LSC
- **2016-2020**: full 100 kg detector at LSC

NEXT 100 kg detector at LSC: main features

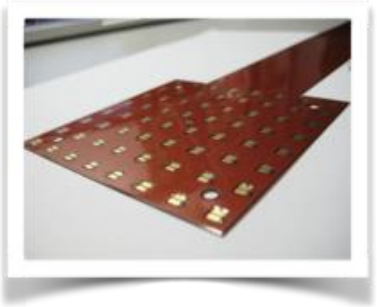
Time Projection Chamber:
100 kg active region, 130 cm drift length

Pressure vessel:
stainless steel,15 bar max pressure

Energy plane:
60 PMTs,
30% coverage



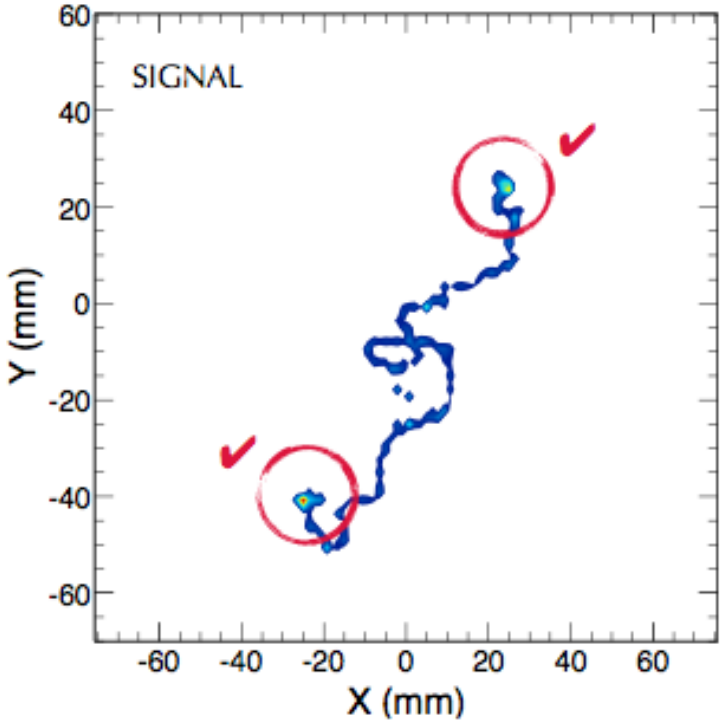
Tracking plane:
7,000 SiPMs,
1 cm pitch

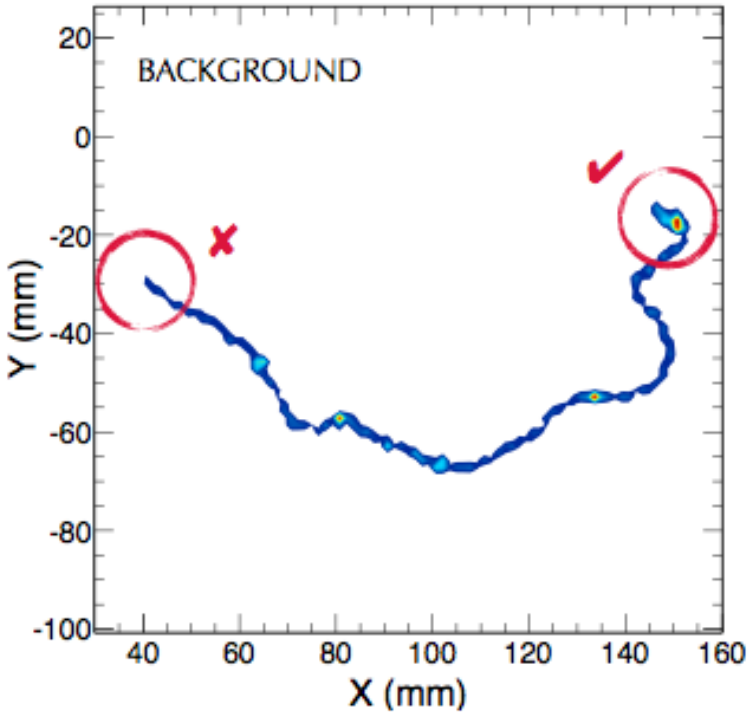


Outer shield:
lead, 20 cm thick

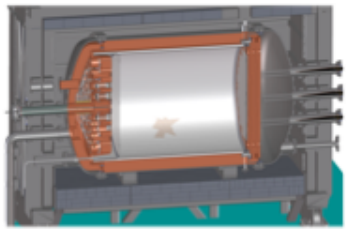
Inner shield:
copper, 12 cm thick

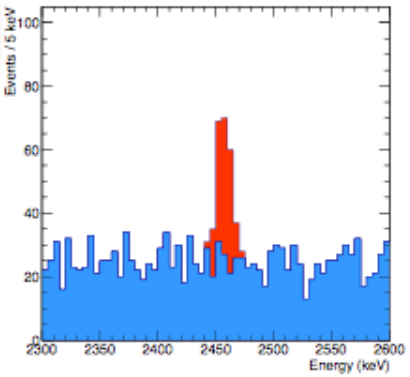
Topological Signature

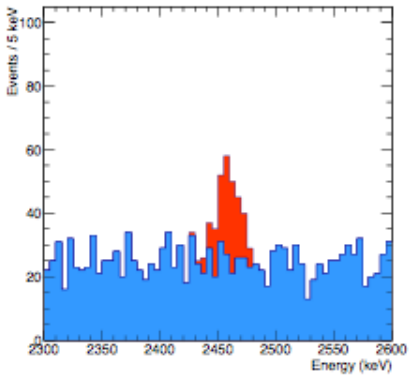




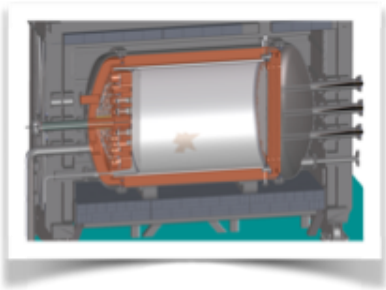
0,5 % FWHM



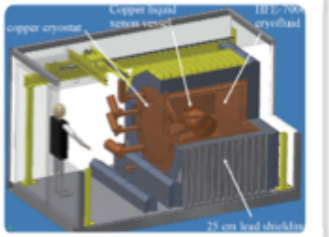


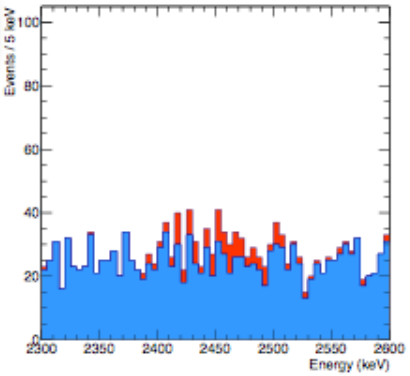


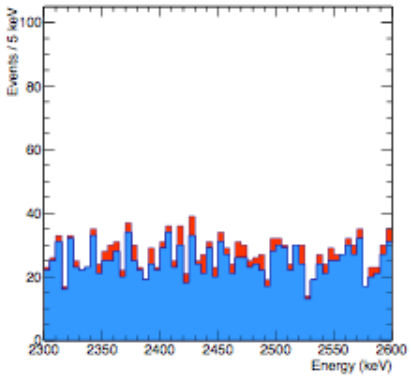
1,0 % FWHM



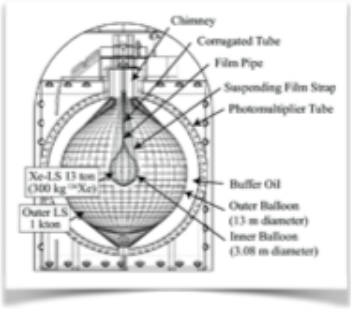
4,0 % FWHM







10 % FWHM

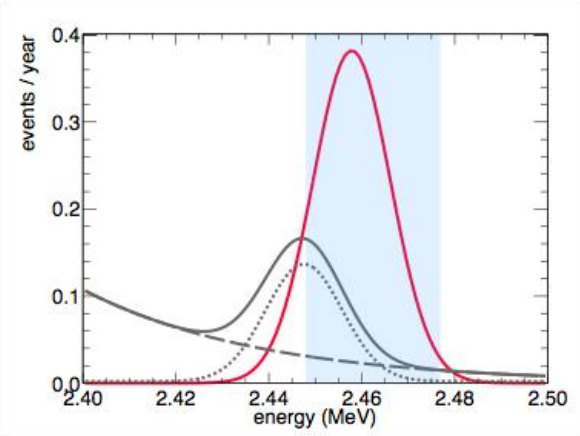


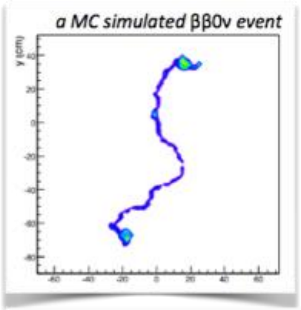
Signal and background:

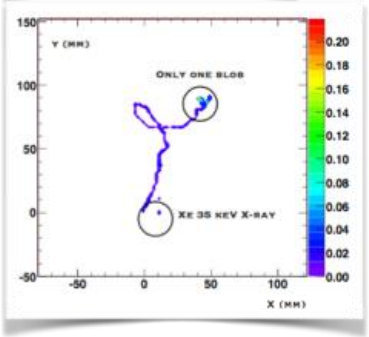
- Signal: mv ~200 meV and an exposure of 5 ton year.
- Background 1 count/keV/ton/year.

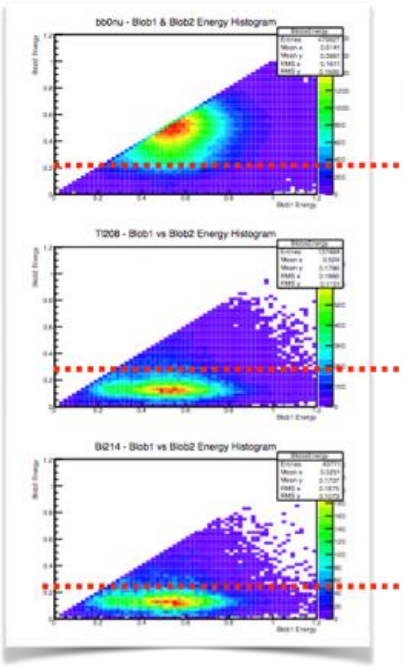
Energy resolution

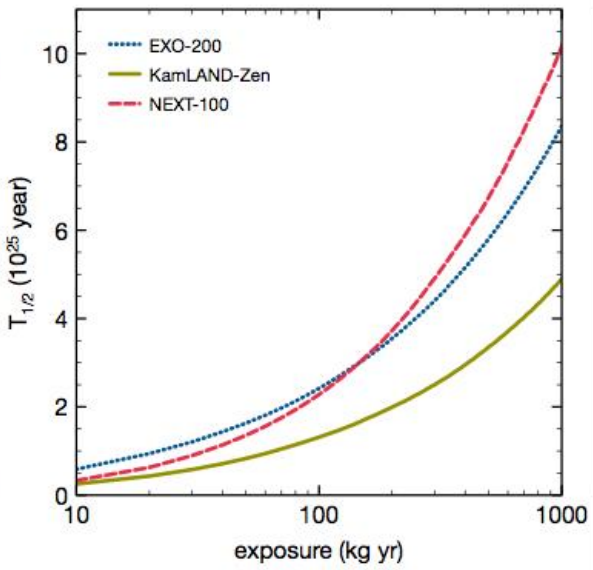
Selection criterion	$0\nu\beta\beta$	$2\nu\beta\beta$	^{208}Tl	^{214}Bi
Fiducial, single track $E \in [2.4, 2.5]$ MeV	0.4759	8.06×10^{-9}	2.83×10^{-5}	1.04×10^{-5}
Track with 2 blobs	0.6851	0.6851	0.1141	0.105
Energy ROI	0.8661	3.89×10^{-5}	0.150	0.457
Total	0.2824	2.15×10^{-13}	4.9×10^{-7}	4.9×10^{-7}

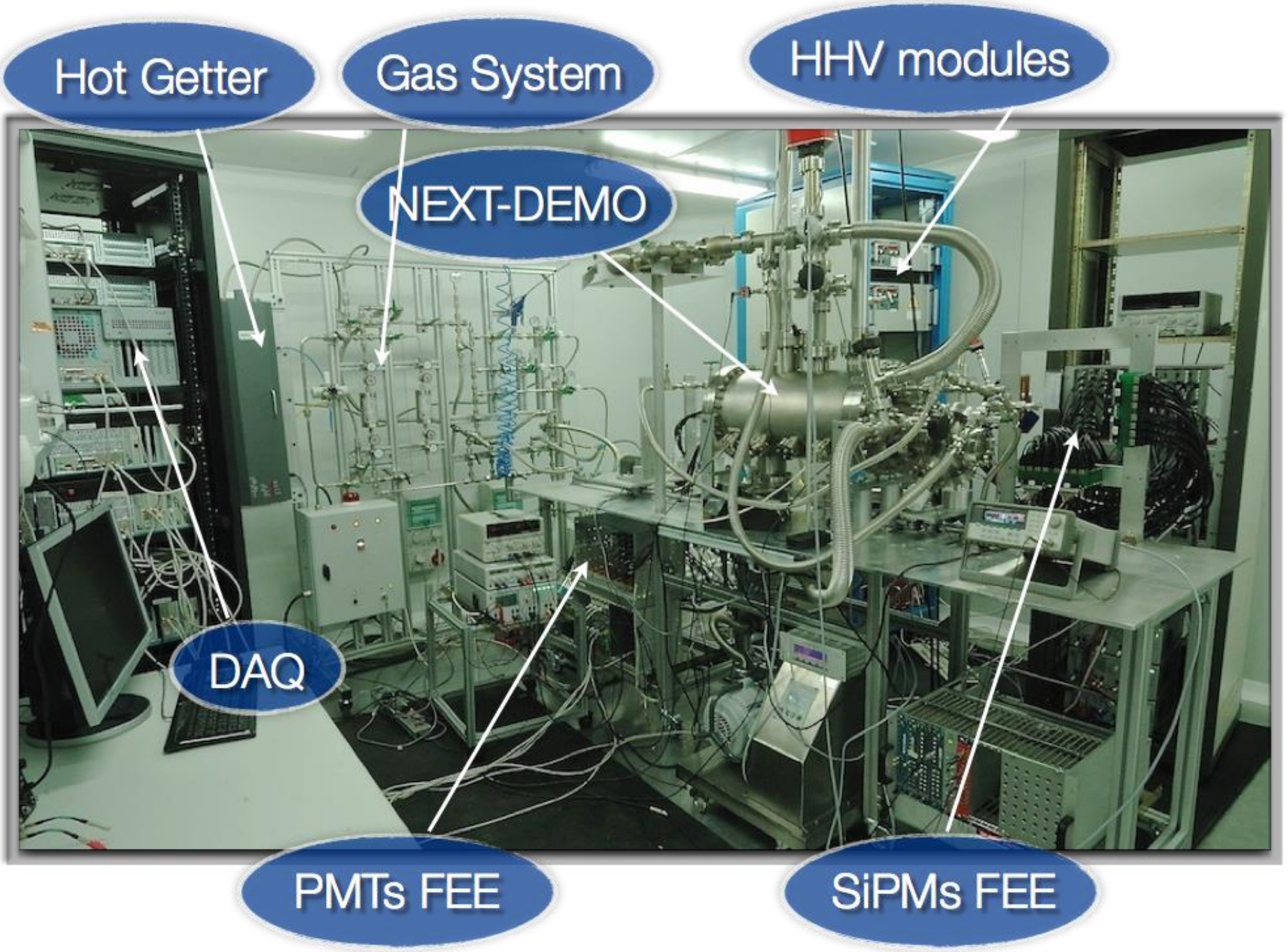






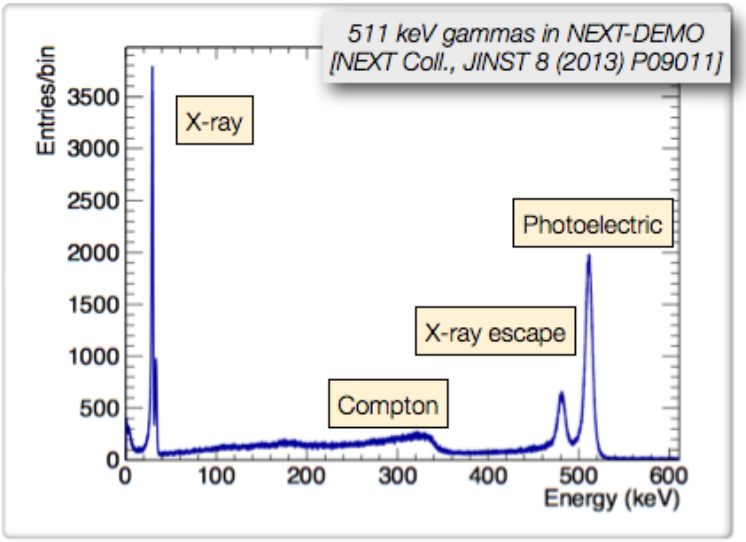




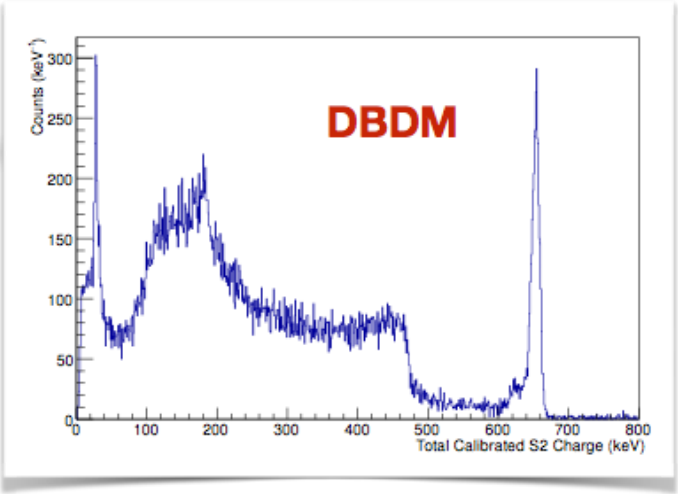

Hot Getter
Gas System
HHV modules
NEXT-DEMO
DAQ
PMTs FEE
SiPMs FEE

NEXT R&D: detector performance achievements

- 1.8% FWHM energy resolution for 511 keV electrons over large fiducial volume
- Extrapolates to 0.75% FWHM at $Q_{\beta\beta}$ energy of 136Xe decay



- The DBDM prototype at LBNL extrapolates to **0.5 % FWHM** at $Q_{\beta\beta}$ using 660 Cs-137 electrons

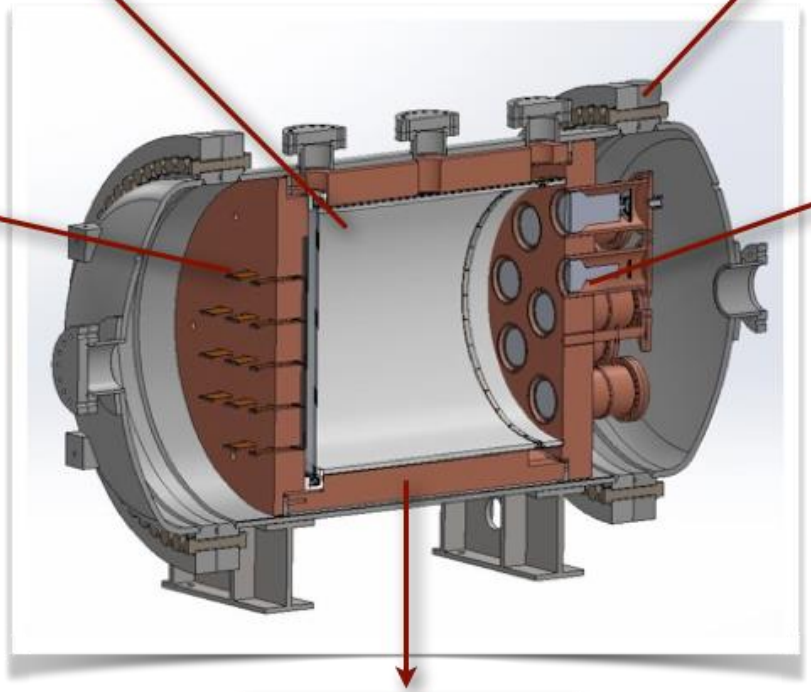


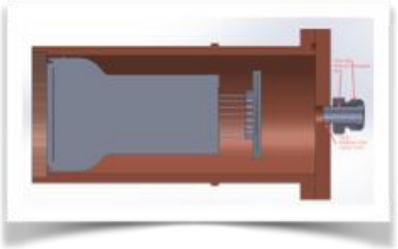
NEW (NEXT-WHITE) at glance

Time Projection Chamber:
10 kg active region, 50 cm drift length

Pressure vessel:
316-Ti steel, 30 bar max pressure

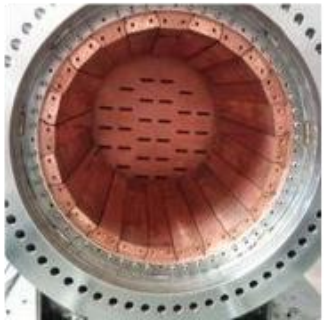
Tracking plane:
1,800 SiPMs,
1 cm pitch



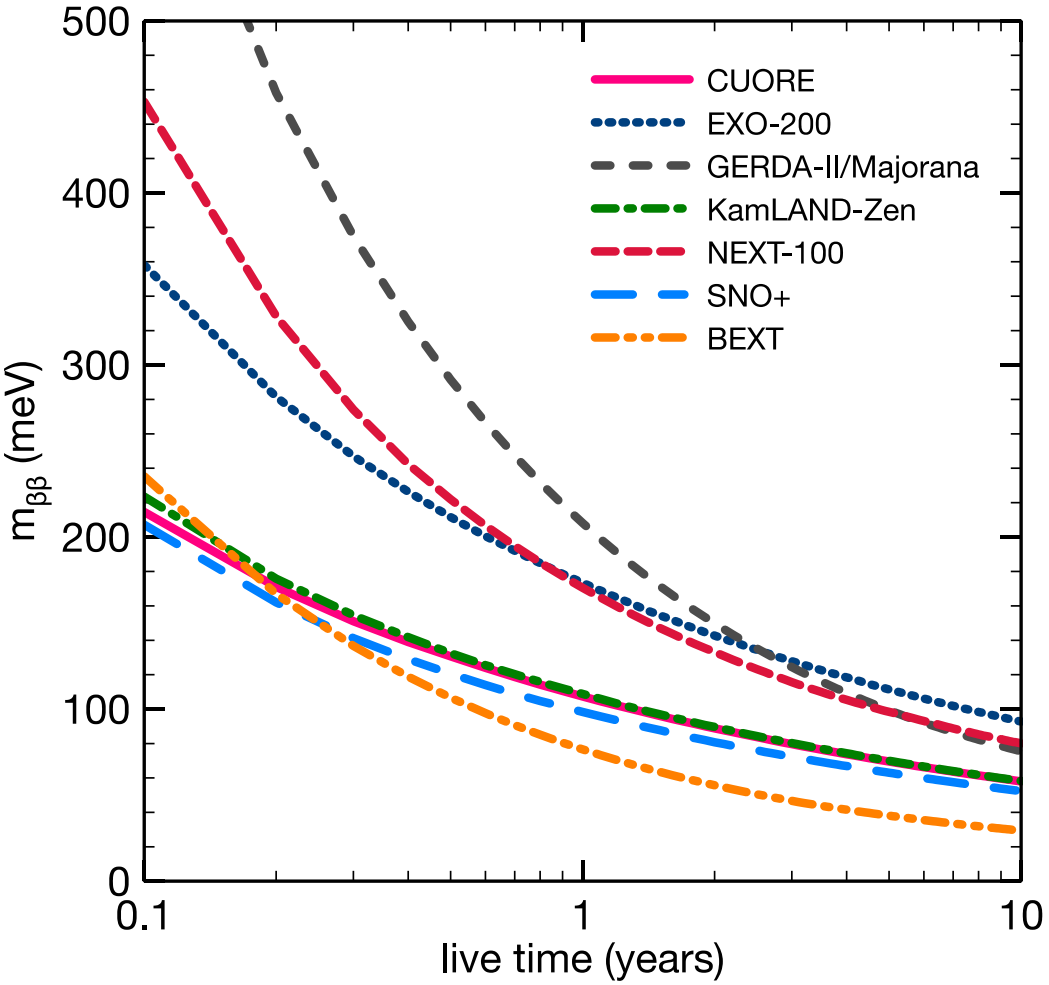


Inner shield:
copper, 6 cm thick

NEW being commissioned at LSC



Sensitivity

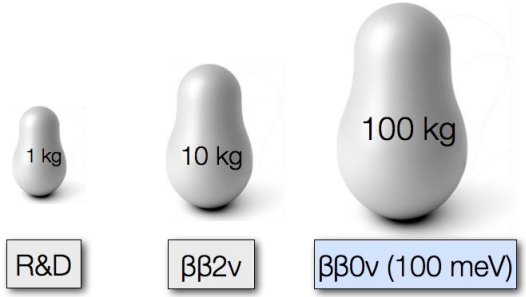


BEXT: An upgrade of NEXT

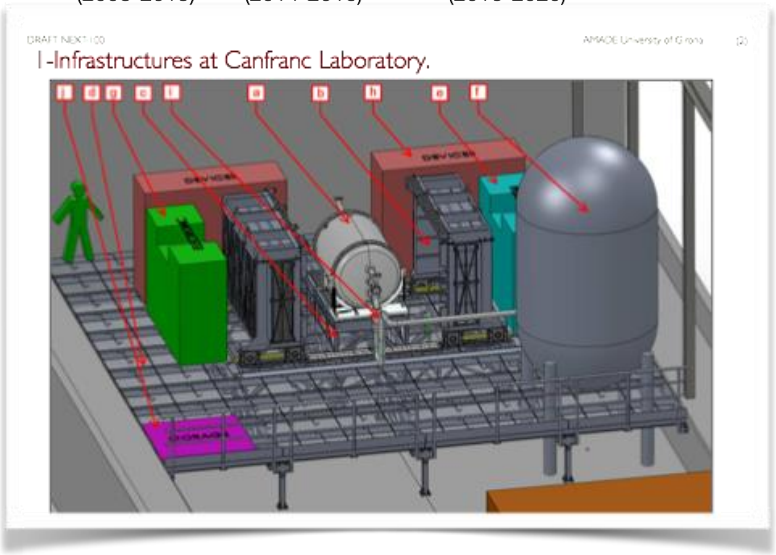
1)Mass 500 kg
2)B = 10-4 ckky**
3)Resolution =.5 %

BEXT is a "fast upgrade" (no technological breakthrough of NEXT)

NEXT at LSC



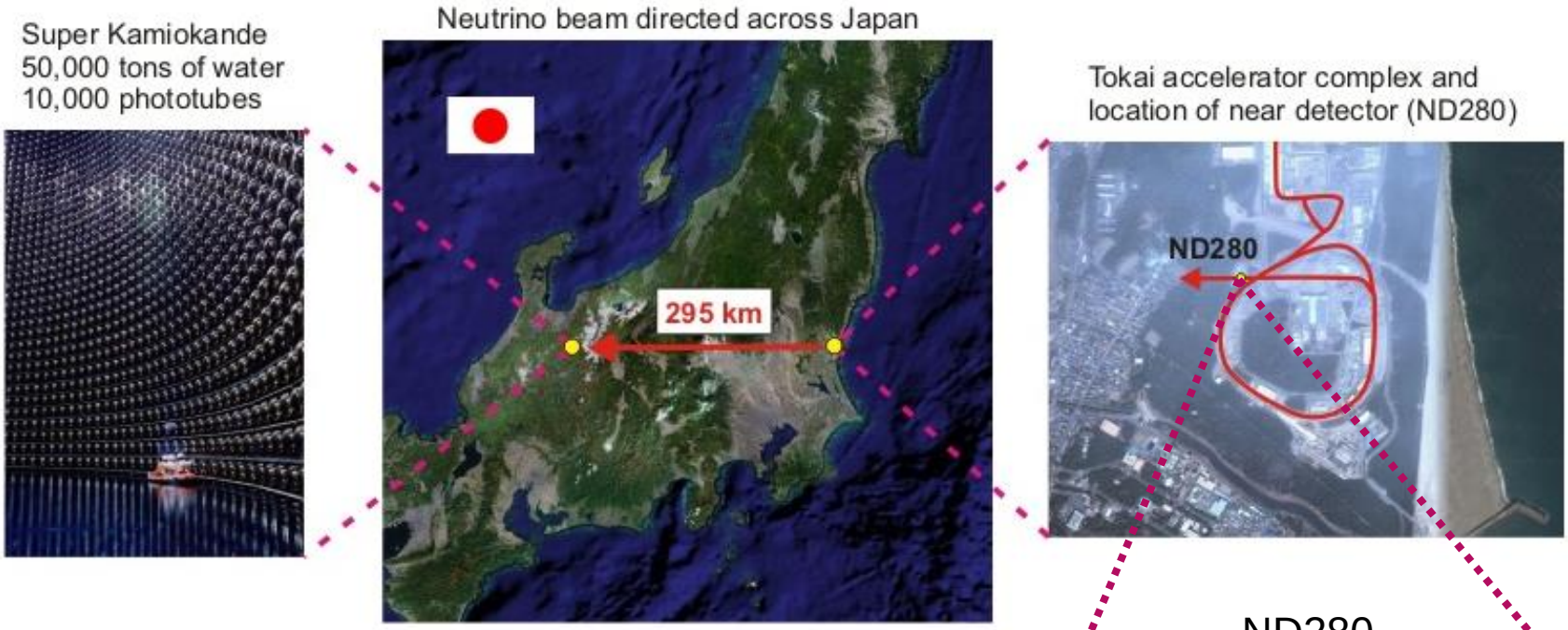
(2008-2013) (2014-2016) (2016-2020)



Infrastructures: platform, lead castle, gas system, emergency recovery system, completed. First phase of experiment starts in 2015. In stock, 100 kg of enriched xenon and 100 kg of depleted xenon.

T2K

Búsqueda de la oscilación subdominante $\nu_\mu \rightarrow \nu_e$ con el fin de medir el ultimo ángulo de mezcla θ_{13}, paso previo al estudio de violación de CP.



ND280

Contribución del IFIC:

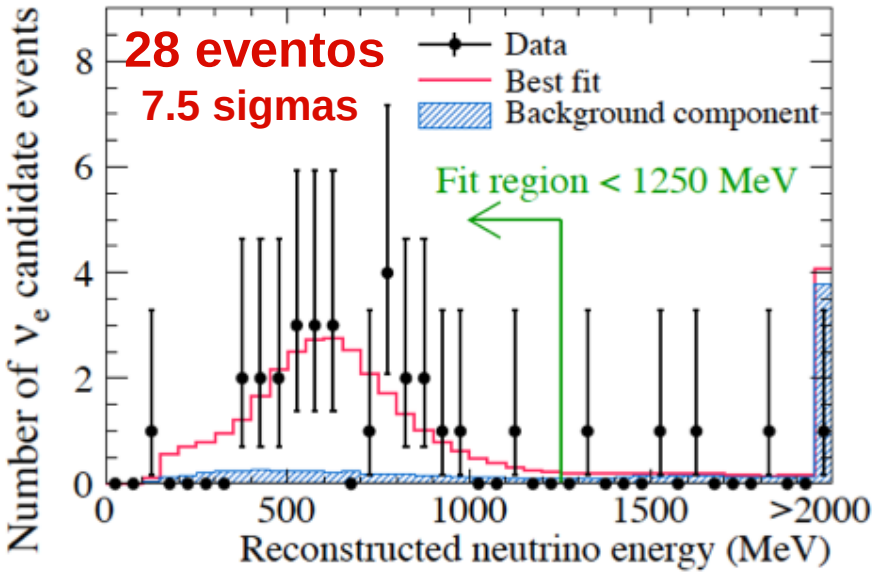
- construcción, calibración de las TPCs
- software de reconstrucción y framework de análisis
- análisis de datos del detector cercano ND280
- Medida del flujo y sección eficaz CCQE
- análisis de datos de Super-Kamiokande
- pionero en el análisis simultáneo de ν_μ y ν_e

6.57 10^{20} POT acumulados (8% del objetivo final)

Observación aparición de ν_e's y medida de θ_{13}

Mejor medida de θ_{23}

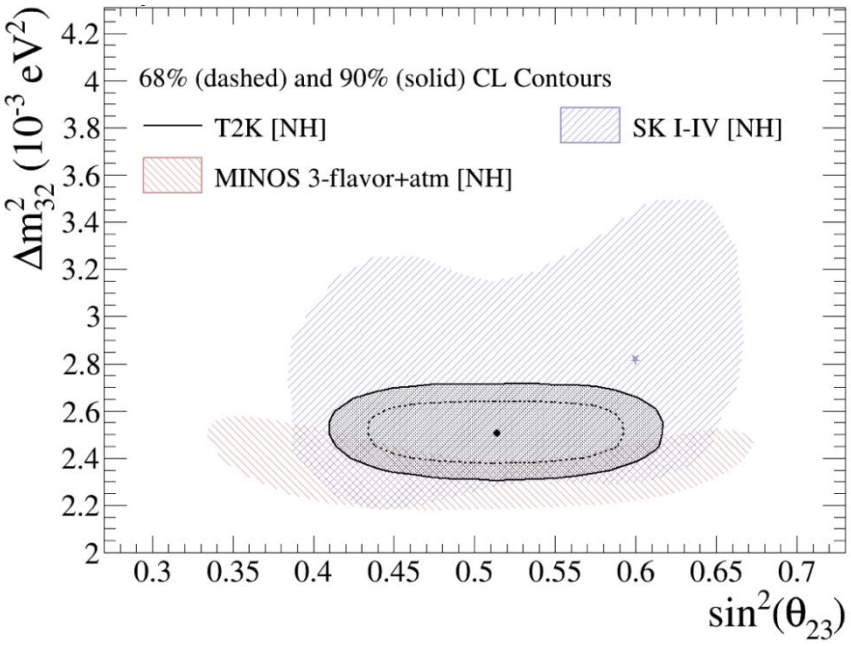
Análisis de aparición de ν_e's



Para jerarquía normal y δ_{CP}=0:

$$\sin^2 2\theta_{13} = 0.14^{+0.038}_{-0.032}$$

Análisis de desaparición de ν_μ's



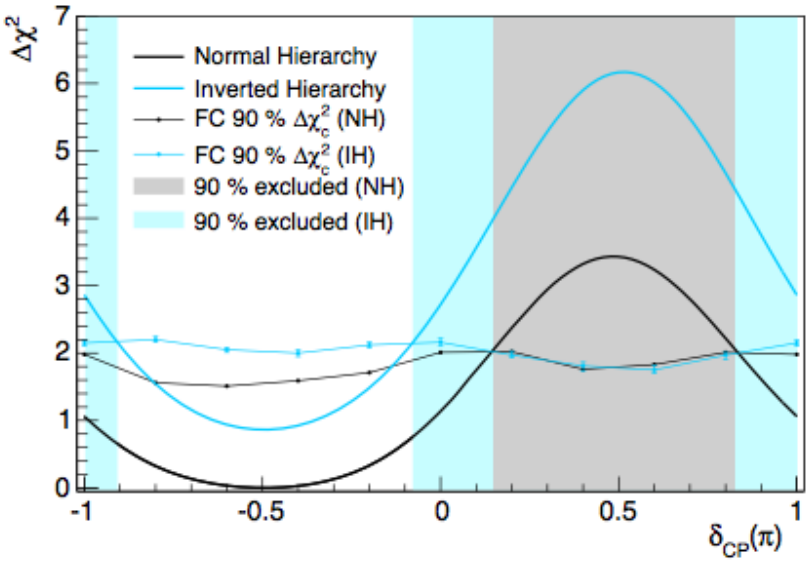
IFIC ha contribuido a la medida del flujo en el detector cercano

6.57 10^{20} POT acumulados (8% del objetivo final)

Primera pista sobre CP

Tesis en nuestro grupo:
Lorena Escudero

Análisis simultáneo de aparición de ν_e's y desaparición de ν_μ's

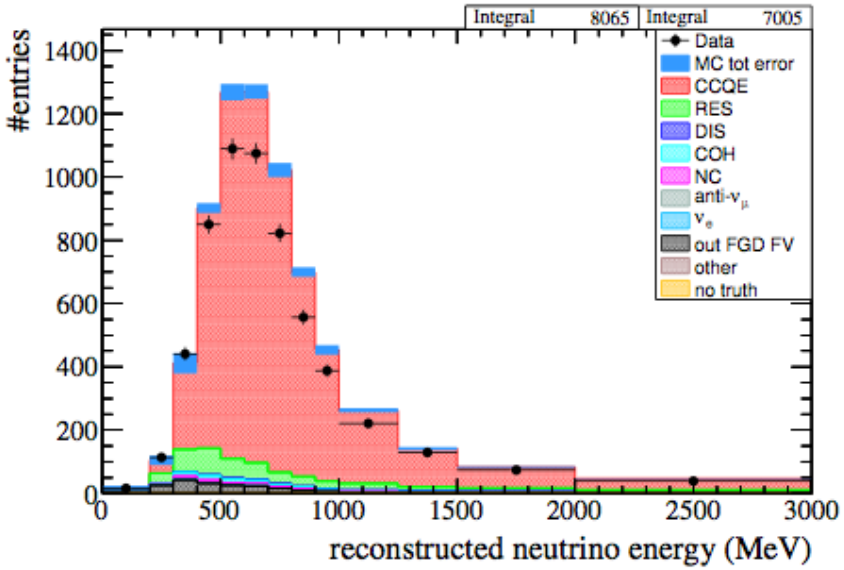


en combinación con los resultados de reactores (Daya-Bay, etc)

Medida sección eficaz CCQE

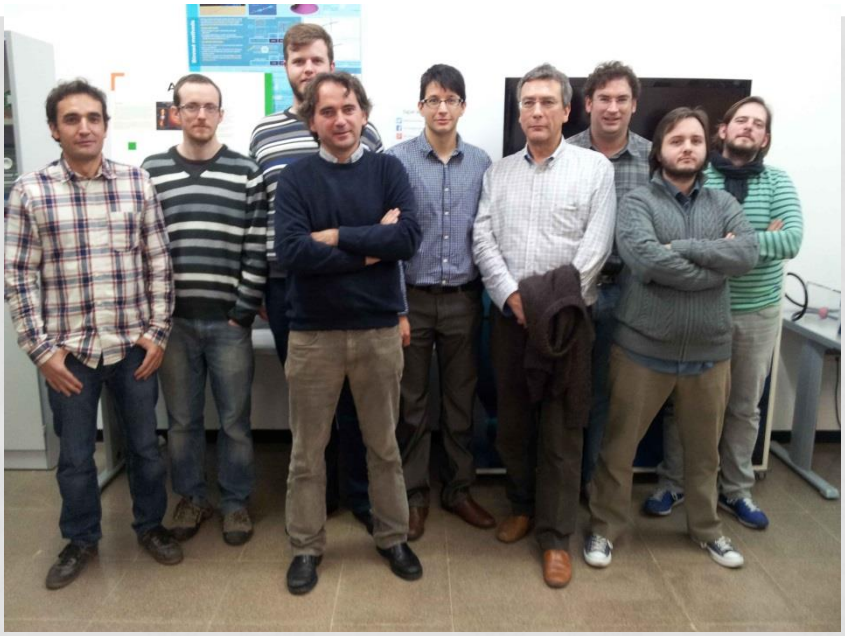
Tesis en nuestro grupo:
Laura Monfregola

Selección de eventos en multiples topologías



análisis en revisión interna

ANTARES / KM3NeT



ANTARES – KM3NeT

- Juan José Hernández-Rey (Profesor de Investigación CSIC)
- Juan Zúñiga (Profesor Titular UV)

permanent

- Juan de Dios Zornoza (Ramón y Cajal)
- Manuel Bou-Cabo (Contratado MultiDark)

post-docs

- Agustín Sánchez-Losa (FPI)
- Javier Barrios (Atracció de Talent)
- Christoph Tönnis (Grisolía)

PhD students

- Ibles Olcina (JAE Intro)

student

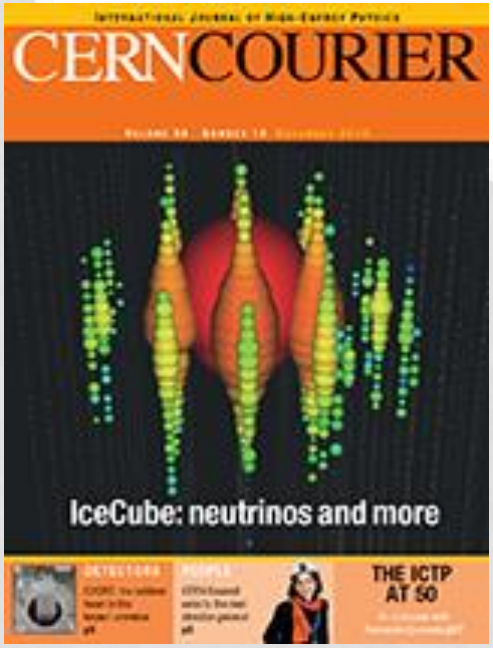
- Diego Real (Contratado Proyecto)
- David Calvo (Contratado Proyecto)

engineers

OTHER NEWS

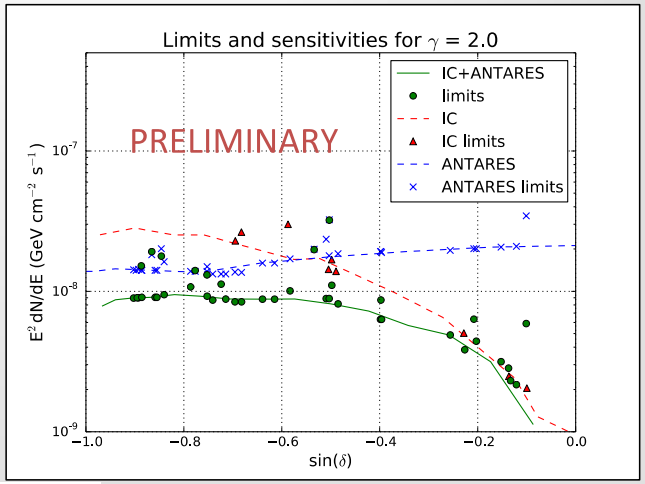
- Harold Yepes defended his thesis in June and is now at Fermilab working on MINERvA as postdoc of CBPF (Brazil).
- Juanan Aguilar got a permanent position in the Free University of Brussels (ULB) for IceCube
- Guillaume Lambard got a Postdoc position in Institute for Basic Research (IBS, South Korea)

Discovery by IceCube has triggered a tsunami of papers to explain these events

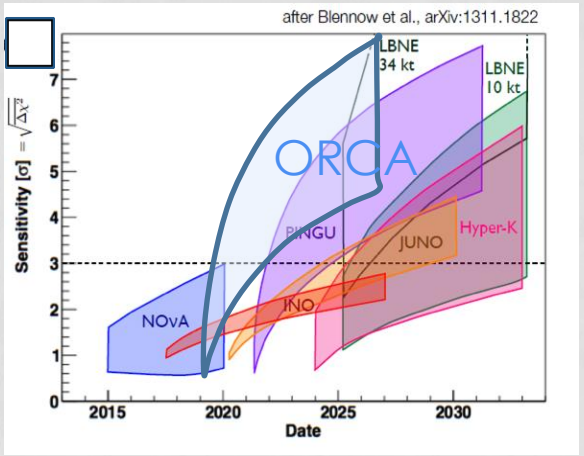


MILESTONES

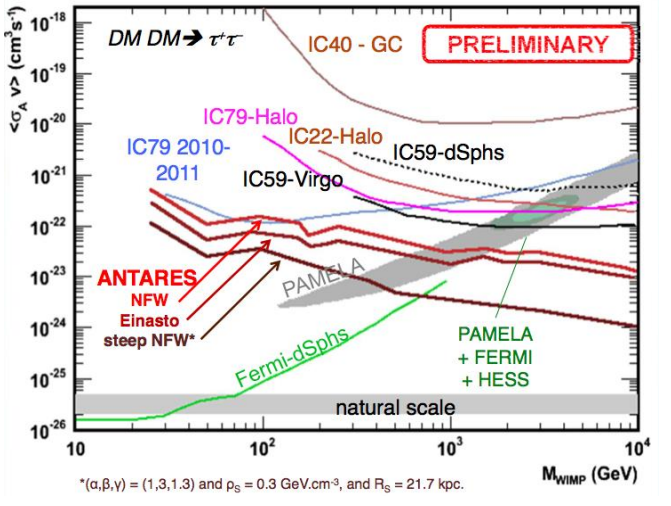
ANTARES – KM3NeT



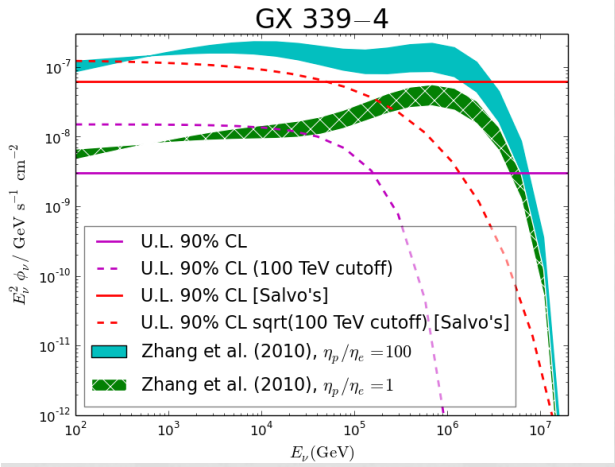
First ANTARES+IC joint analysis made by Javier Barrios



First estimations of ORCA sensitivities for Neutrino Mass Hierarchy



DM limits for Galactic Center



Correlations with flaring objects

KM3NET

"After the **signal** detected by IceCube, the collaboration has to react **promptly** to build **KM3NeT 1.5** to confirm and study such a signal", *M. **Spiro**, chairman of the Scientific and Technical Committee of KM3NeT*

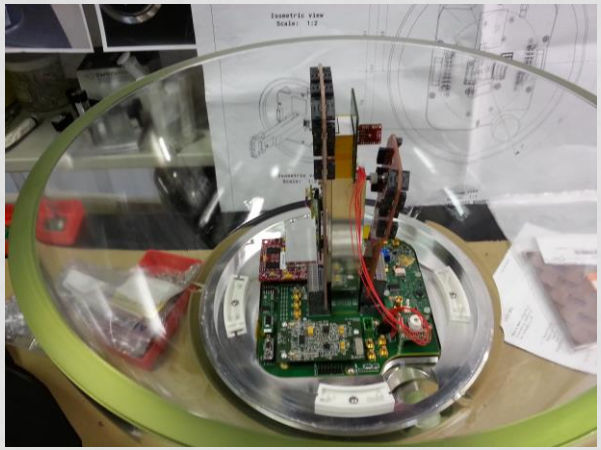
Status of the project

- Paper with the performance of the prototype multi-PMT DOM published
- Prototype Detection Unit (string) **successfully** working at KM3NeT-Italy site
- Phase I started. First standard DU being integrated, to be installed by **Spring 2015**

PDU in the Launching Module about to be installed

Role of IFIC

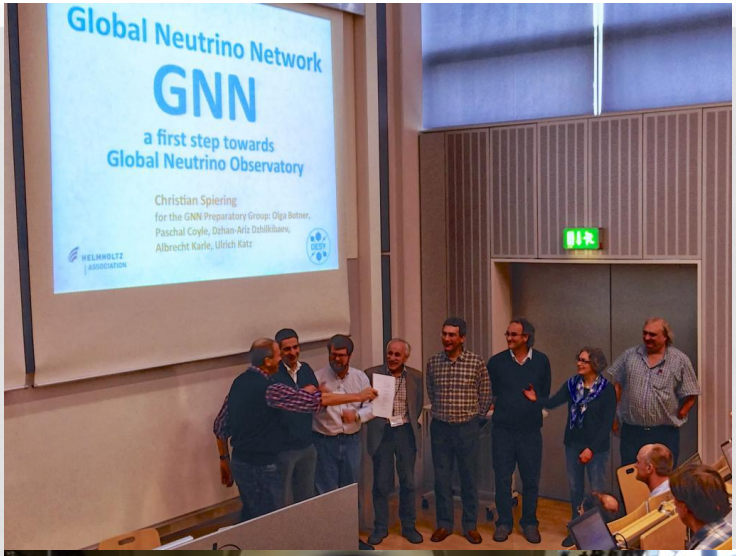
- **Coordination** of Electronics in KM3NeT: **Diego Real**
- **Coordination** of Time Calibration in KM3NeT: **Juande Zornoza**
- In charge of the design of:
  - Control Logic Board
  - Time Calibration System



Control Logic Board

GNN AND MOU

- GNN (Global Neutrino Network) was founded in Garching by representatives of ANTARES, IceCube, KM3NeT and Baikal on October 15th
- The Memorandum of Understanding of KM3NeT was signed in Paris on June 30th



WORKSHOPS


DARK GHOSTS
1st GNN Workshop on Indirect Dark Matter Searches with Neutrino Telescopes
IFIC - Valencia, 10th-11th April 2014
ANTARES
GNN
KM3NeT
LAKE BAIKAL NEUTRINO TELESCOPE
Topics:
-Where do we stand? Summary of lastest results
-Detector performance: effective area, energy threshold...
-Signal simulation
-Analysis techniques and limit setting
-Discussion on sources (pros/cons):
Sun, GC, Earth, dwarf galaxies, galaxy clusters...
-Combination of analyses
-Plans for extensions to lower energies
International Scientific Commitee:
Vincent Bertin (CPPM)
Carlos Pérez de los Heros (U. Uppsala)
Olga Suvorova (INR RAS, Moscow)
Local Organizing Committee:
Juan José Hernández-Rey
Juan Zúñiga Román
Juan de Dios Zornoza Gómez
Registration and more information: http://goo.gl/YqVIoA
GNN
MultiDark
Multimessenger Approach for Dark Matter Detection
IFIC
INSTITUT DE FÍSICA CORPUSCULAR
VNIVERSITAT DE VALÈNCIA


10th MULTIDARK Consolider Workshop
IFIC, Valencia
2 - 4 April, 2014
MultiDark
IFIC
CSIC
Consolider
Ingenio 2010
Consolider-Ingenio 2010 project
Multimessenger Approach for Dark Matter Detection - MultiDark
Local organizers
M.Ardid M.S.Boucenna J.J.Hernández-Rey R.A.Lineros S.Pastor J.W.F.Valle J.D.Zornoza J.Zúñiga
MultiDark Office Manager
Susana Hernández
www.multidark.es
Participant Institutions:
IFAE

SELECTED CONFERENCES

- "Recent results of the ANTARES neutrino telescope" J.J. Hernández, **Neutrino** 2014, Boston
- "Overview of ANTARES results on DM searches", J.D. Zornoza, **Moriond-Cosmology** 2014, La Thuille
- "Search of point-like sources using the ANTARES neutrino telescope", J. Barrios, **ERCS** 2014, Kiel
- "Indirect search for dark matter with the ANTARES neutrino telescope", C. Toennis, **DSU** 2014, Cape Town
- "The Time Calibration System of KM3NeT: The Laser Beacon and the Nanobeacon", D. Real, **MARSS** 2014,
- "High-Resolution Time To Digital Converters for the KM3NeT Neutrino Telescope", D. Calvo, **TWEPP** 2014, Aix en Provence

FÍSICA MÉDICA

Física Médica: Grupo IRIS

http://ific.uv.es/iris

Image Reconstruction, Instrumentation & Simulation in Medical Imaging Applications

Dr. Carlos Lacasta, **CSIC**

Dr. Gabriela Llosá, Ramón y Cajal.

Dr. Josep F. Oliver, postdoc contrato

John Barrio, doctorando UV '*Atracció de talent'.*

Ane Etxebeste, doctoranda Generalitat

Enrique Muñoz, doctorando

Dr. Paola Solevi, contrato postdoc

Karol Brzezinski, doctorando JAE PRE

Marco Trovato, doctorando Marie Curie

Contrato de año y medio o menos

Sin contrato/dejan el grupo en breve

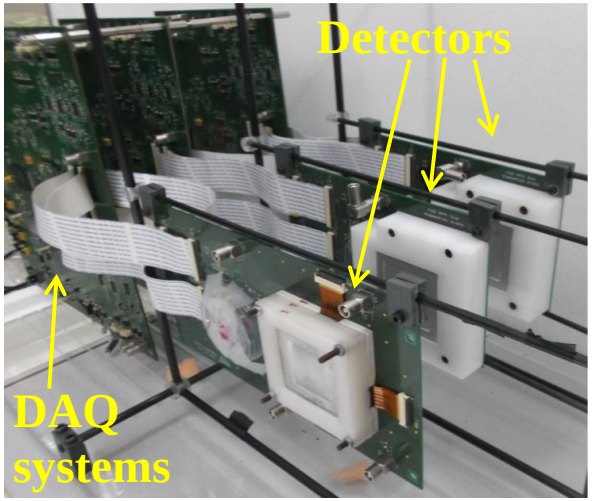
Sin proyecto en la actualidad

Solicitudes en curso: **Plan Estatal (Jóvenes Investigadores, Jóvenes sin vinculación, EXPLORA), 3 Proyectos H2020 (uno como coordinadores), 2 Proyectos UV-La Fe...**

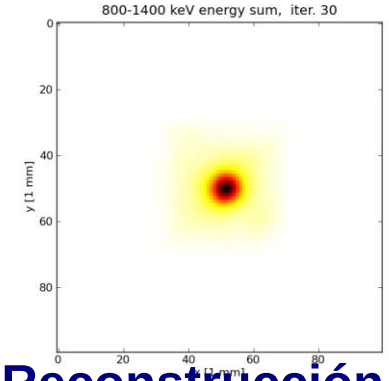
Colaboraciones internacionales: ENVISION, AX-PET, ASPID, CIMA, MADEIRA, Technische Universität München, Université Sherbrooke.

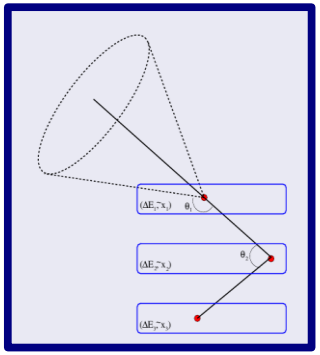
Principales actividades IRIS

ENVISION: Telescopio Compton para monitorización de la dosis en terapia hadrónica.

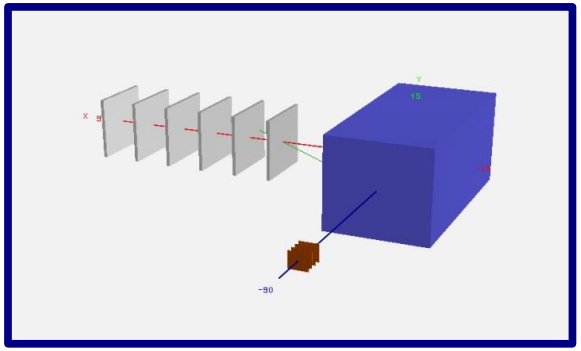


Prototipo de tres planos de $LaBr_3$ y SiPMs funcionando





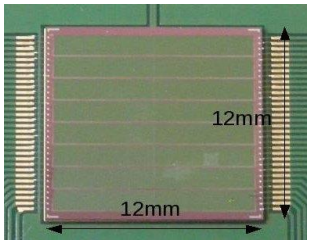
Reconstrucción de imágenes

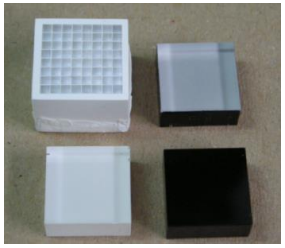


Simulación y optimización

Primeras pruebas en haz de protones de 150 MeV

PETETE: Tomógrafo PET para pequeños animales



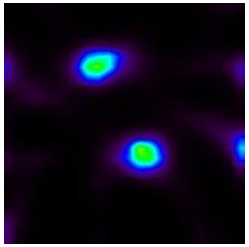


Prototipo con cristales continuos de LYSO y SiPMs.

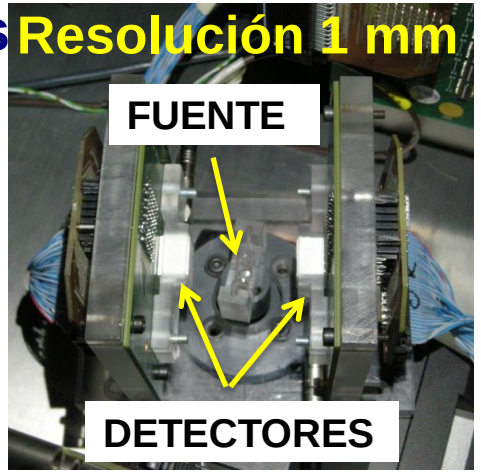
Determinación de la posición y reconstrucción de imágenes.

Excelente resolución espacial.

Trabajo reconocido a nivel internacional.

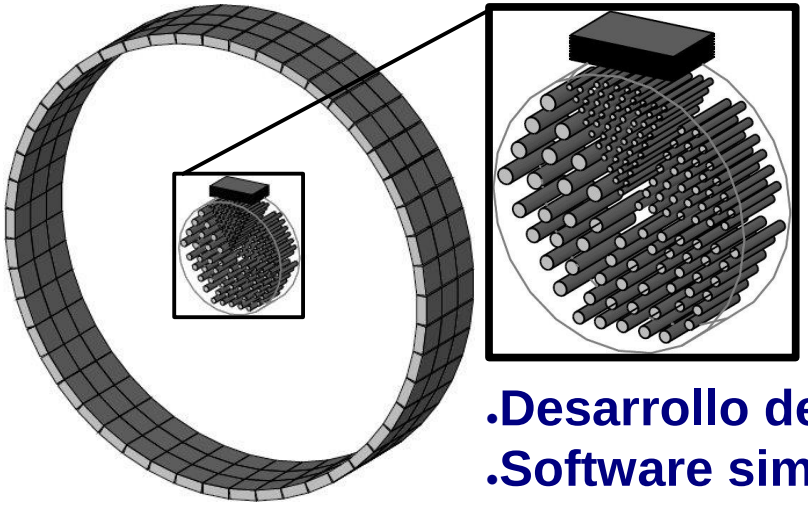


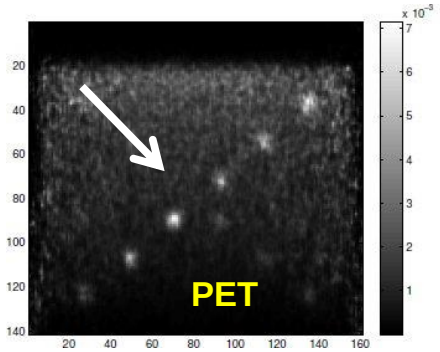
Resolución 1 mm

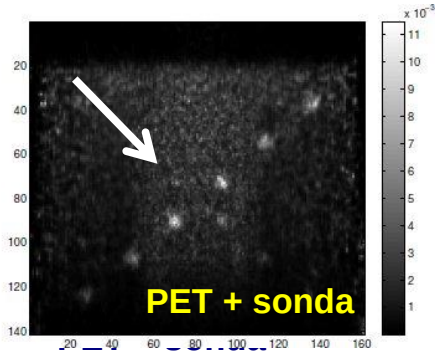


Principales actividades IRIS

MADEIRA: sonda de silicio para mejorar localmente la resolución de un PET





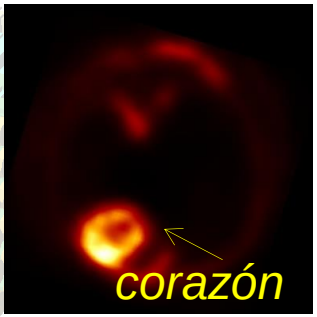


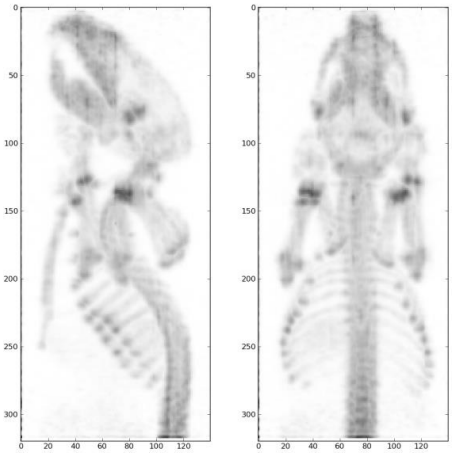
.Desarrollo de sonda y electrónica de lectura
.Software simulación y reconstrucción de imágenes

AX-PET Tomógrafo PET con determinación de la posición 3D.

Software de reconstrucción de imágenes y simulación

Coordinación de campañas con medidas tomográficas





END

Felices Fiestas

BACKUP