

# Computing en NEXT

## Infraestructura de Computación y Almacenamiento para el Experimento NEXT

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# Índice de Contenido:

- **NEXT-NEW:** Estado actual del experimento (producción de datos).
- Infraestructura **RED** proporcionada por el **LSC**.
- Infraestructura **NEXT** instalada en el **LSC**.
- Diagrama del flujo de datos.
- Herramientas: sistemas de registro de runnes, catalogación de ficheros de análisis y monitorización remota de los recursos informáticos.
- Otros tipos de análisis y recursos de computación.
- **NEXT-100:** Estimaciones y planes de escalado computacional / almacenamiento.

# NEXT-NEW – Producción de datos

## ETAPAS NEXT-NEW

28/09/2016

RUN I

calibración

20/02/2017

RUN II

calibración

27/02/2018

RUN III

calibración y producción

- 182.070.773 eventos producidos

- 442 TB datos prod. y almacenados / archivados.

- 7.757 horas producción.

?

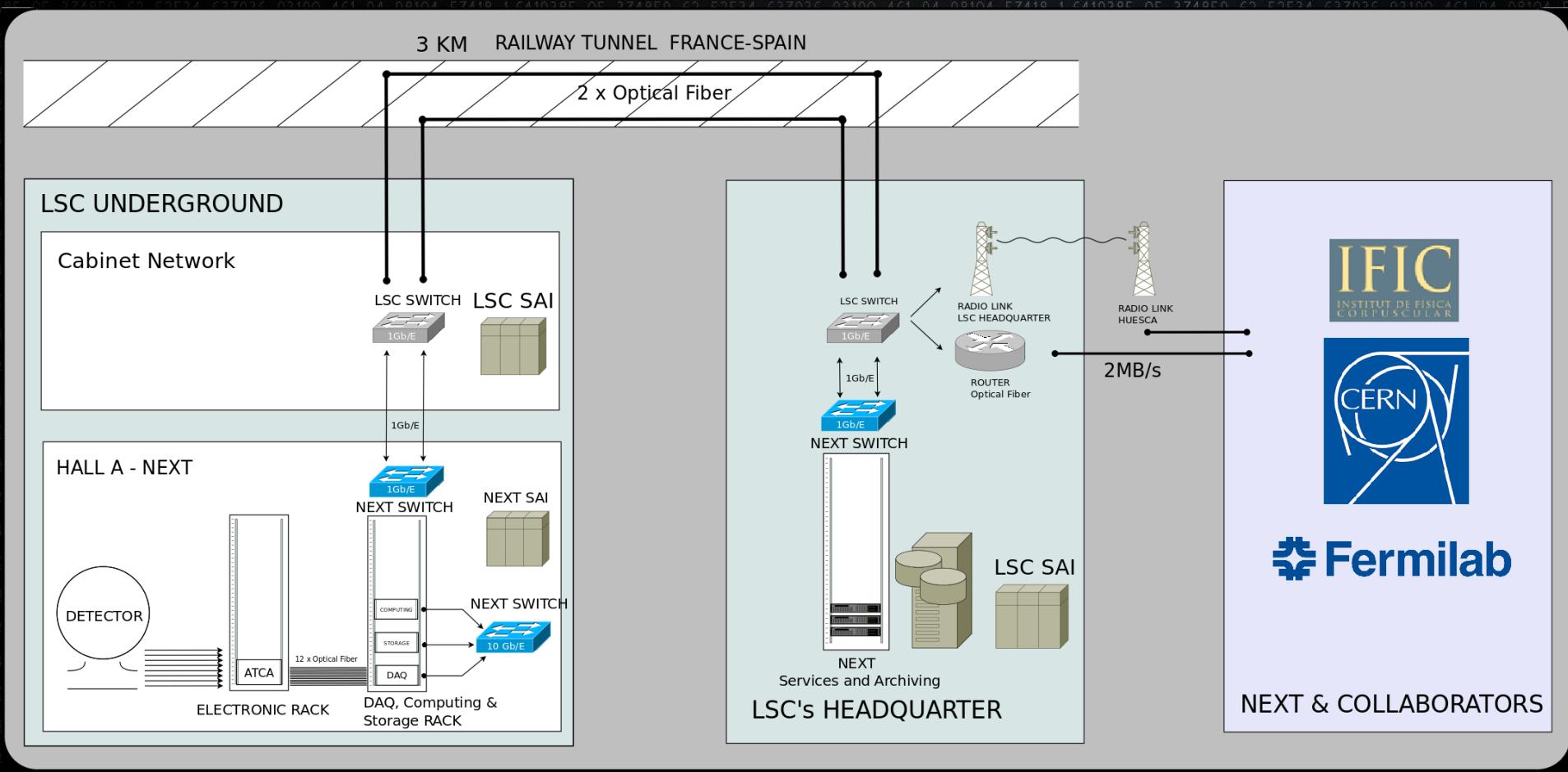
RUN IV

Xenon enriquecido

A partir 2019

NEXT-100

# Infraestructura de red LSC



**IFIC**  
INSTITUT DE FÍSICA  
CORPUSCULAR

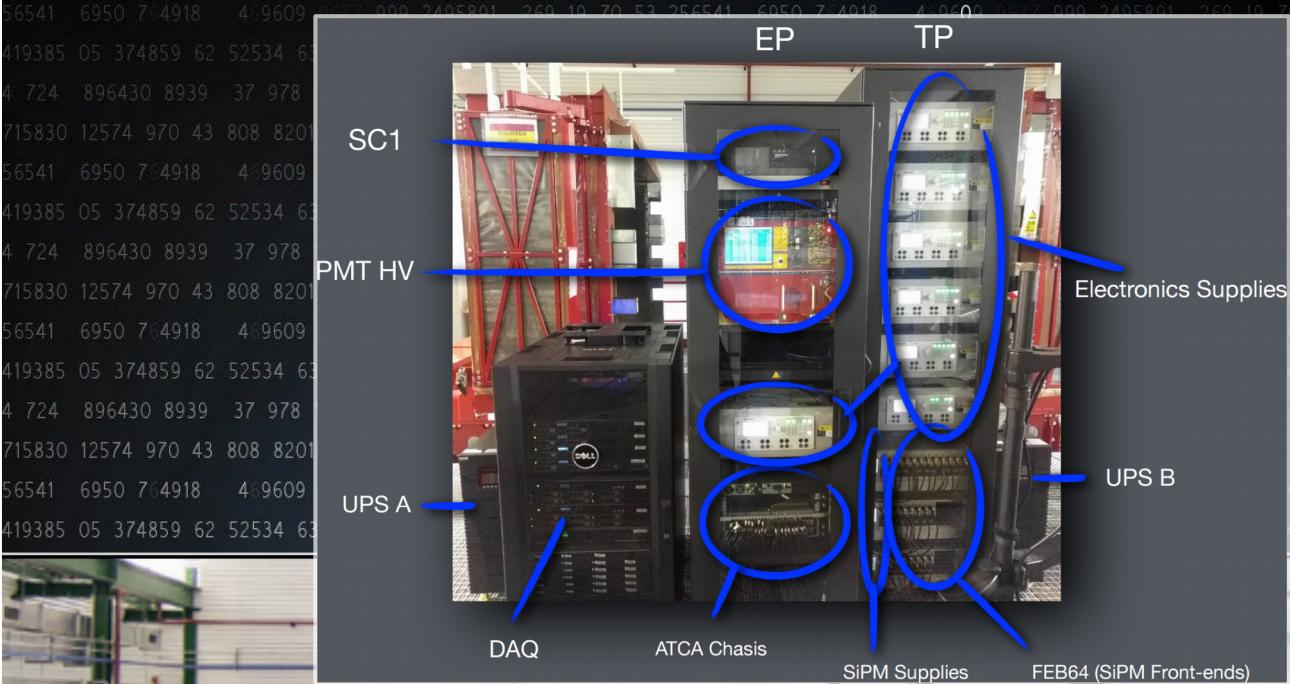


**Fermilab**

**NEXT & COLLABORATORS**

- 2 líneas de fibra óptica unen el LSC y el edificio sede.
- Conexión con internet por radio-link (1 o 2 MB/s) y Fibra óptica (20 Mb/s).
- Electrónica de red del LSC preparada para sólo 1Gb/E
- Temperatura estable dentro del LSC 22º-23º.

# Infraestructura de computación NEXT en LSC



# Tipología de Eventos y Adquisición (DAQ)

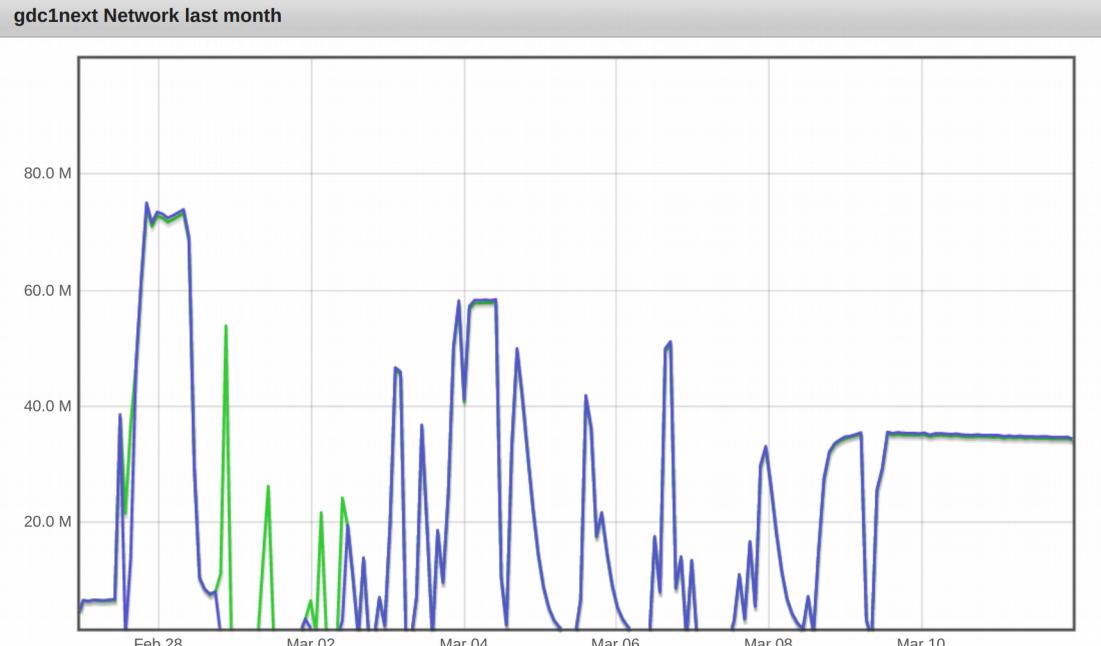
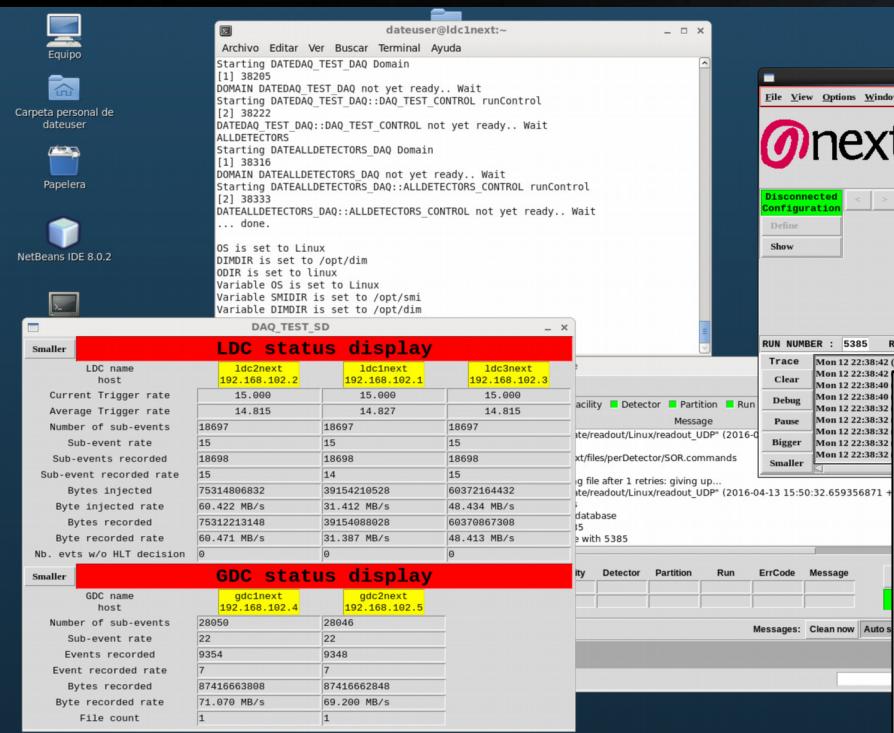
- Dos fases en la toma de datos:

– Calibración: Mayor número de eventos en el menor tiempo:

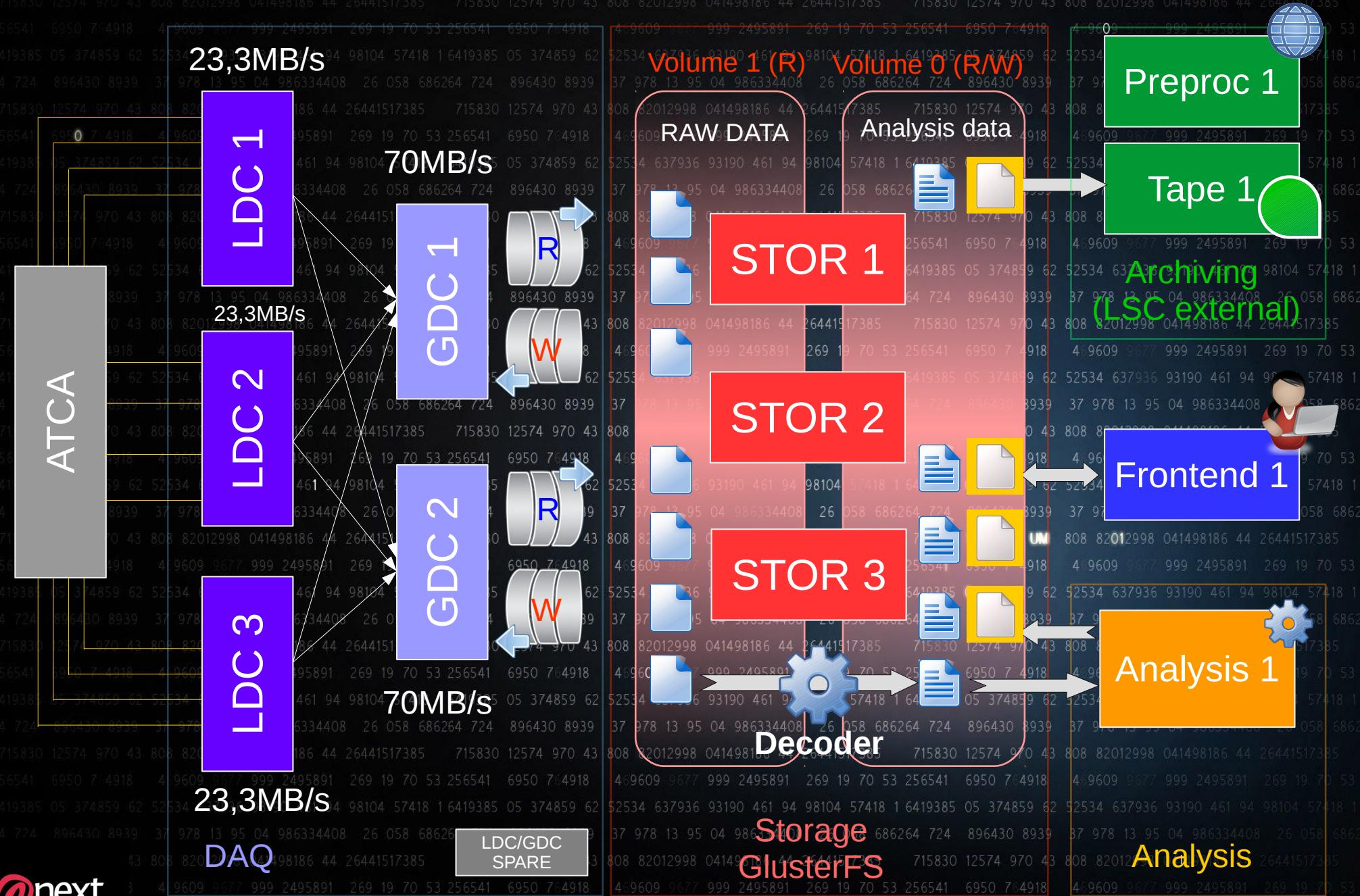
• Picos bit rate:  $2 \text{ GDCs} \times 70 \text{ MB/s} = 140 \text{ MB/s}$ .

Producción: Trigger rate cae pero el buffer por evento sube. Estimación RUN III < 1MB/s.

- Software de adquisición: DATE (CERN).



# Automatización: DAQ, Almacenamiento y Cómputo.



# Resumen recursos NEXT-NEW en el LSC.

- **CPUs:**

- 150 threads para trabajos de decodificación + análisis.

- **Red de almacenamiento y cómputo:**

- Red de cálculo y almacenamiento: 10 Gb/E

- Utilización real: picos globales de 7-8 Gb/s por enlace.

- **Sistema de Almacenamiento distribuido:**

- 3 nodos de almacenamiento GlusterFS (84 discos).

- 300 TB almacenamiento permanente.

- Archivado en librería de cintas LTO7 (LTFS).

- Archivado suplementario en Disco: 32 discos externos (8TB) de archivado.

# Diagrama de Flujo de Datos.

Example RUN 4840 / Source: Kr + Th



# Herramientas de Registro, Catalogación y Monitorización remota.

## Registro de runnes: ELOG (CERN)

195.77.159.50:6080/elog/next-new-calibration/3206

Apps NEXT iDRAC NEXT Monitoring Genomics Data Center Exp https://www.hdf D Robinson - Usr Estado del Servic 74 casas de obra GestionTrabajos PHP Multi Page How to Paginate Other bookmarks

next-demo1 next-new-production next-new-calibration next-new-test next-new-commissioning next-new-troubles

Logged in as "next"

NEXT-NEW ELOG CALIBRATION

Message ID: 3206 Entry time: Wed Nov 1 10:42:04 2017

Run Number: 4797

Author: ATCA

Type: Run Conditions

Run Type: 20- Kr-83 run

Pressure (bar) Temperature (°C) Cathode Voltage (volts) Gate Voltage (volts)

9.064529E+0	42.33	-29499.80	-8499.61
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DETECTOR CONDITIONS - RUN 4797

JAVA CONDITIONS

GENERAL CONFIGURATION

Mode of operation	Normal Mode 1	Buffer Size	1300	Pretrigger	650	Number of Triggers	0	Run Type Code	20- Kr-83 run
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TRIGGER CONFIGURATION

GLOBAL PARAMETERS

Trigger Mask	Trigger freq	Auto External Trigger	External Trigger	Double Trigger	Max. Time Trg A/B	Events Trg A	Events Trg B	CW size Trg A	CW size Trg B
ON	20	OFF	OFF	OFF	0	2	1	20	1

FEC 0 disconnected FEC 2 disconnected FEC 4 disconnected FEC 6 disconnected FEC 8 disconnected FEC 10 disconnected FEC 12 disconnected

NO									
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PMT FE CONNECTED CARD

FEC 2

PMT 0	PMT 1	PMT 2	PMT 3	PMT 4	PMT 5	PMT 6	PMT 7	PMT 8	PMT 9	PMT 10	PMT 11	PMT 12	PMT 13	PMT 14	PMT 15	PMT 16	PMT 17	PMT 18	PMT 19	PMT 20	PMT 21	PMT 22	PMT 23	PMT 24	PMT 25	PMT 26	PMT 27	PMT 28	PMT 29	PMT 30	PMT 31	
NO	YES	NO	NO	YES	YES	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	YES	NO	NO	NO	NO	YES	NO	NO	YES

PMT FEC2

Filter Samples	Thr	Post Samples	Pre Samples	Filter Samples	Thr	Post Samples	Pre Samples
3	5	500	500	3	5	500	500

PMT ZS CONFIGURATION

PMT FEC10

Filter Samples	Thr	Post Samples	Pre Samples
3	5	500	500

PMT CHANNEL TRIGGER A CONFIGURATION

CH18	Trigger ON/OFF	Inv Polarity	Trigger Q	Auto BS	TRG B	Baseline dev.	Max Amplitude	Q min	Q max	Int. Ev. Qmin	Int. Ev. Qmax	Amp. Thr1	Amp. Thr2	Max Time Thr (ns)	Min Time Thr (ns)	Mask Time Thr (ns)	Pulse Valid Ext. (ns)
CH19	1	0	1	1	0	10	500	5000	50000	5000	50000	162500	162500	2000	2000	50	

PMT CHANNEL TRIGGER B CONFIGURATION

CH18	Trigger ON/OFF	Inv Polarity	Trigger Q	Auto BS	TRG B	Baseline dev.	Max Amplitude	Q min	Q max	Int. Ev. Qmin	Int. Ev. Qmax	Amp. Thr1	Amp. Thr2	Max Time Thr (ns)	Min Time Thr (ns)	Mask Time Thr (ns)	Pulse Valid Ext. (ns)
CH19	1	0	1	1	0	10	500	5000	50000	5000	50000	162500	162500	2000	2000	50	

PMT CHANNEL TRIGGER EXT CONFIGURATION

CH18	Trigger ON/OFF	Inv Polarity	Trigger Q	Auto BS	TRG B	Baseline dev.	Max Amplitude	Q min	Q max	Int. Ev. Qmin	Int. Ev. Qmax	Amp. Thr1	Amp. Thr2	Max Time Thr (ns)	Min Time Thr (ns)	Mask Time Thr (ns)	Pulse Valid Ext. (ns)
CH19	1	0	1	1	0	10	500	5000	50000	5000	50000	162500	162500	2000	2000	50	

PMT CHANNEL BLR CONFIGURATION

CH0	ON/OFF	Reset	DM	Mau size	Mau threshold	Discharge line	Discharge slope	Dis. coef H	Dis. coef L	Acum thr L	Acum thr H	DWI	HPF	TRGM		
CH1	1	0	0	1024	15	2	4	0	0	1	4000	0	0	0		
CH2	1	0	0	1024	15	2	4	0	0	1	4000	0	0	0		
CH3	1	0	0	1024	15	2	4	0	0	1	4000	0	0	0		
CH4	1	1	1	1024	5	2	1	52953	16375	1	4000	1	1	1		
CH5	1	1	1	1024	5	2	1	52953	16375	1	4000	1	1	1		
CH6	1	0	0	1024	15	2	4	0	0	1	4000	0	0	0		
CH7	1	0	0	1024	15	2	4	0	0	1	4000	0	0	0		
CH8	1	1	1	1024	5	2	1	52953	16375	1	4000	1	1	1		
CH9	1	1	1	1024	5	2	1	52953	16375	1	4000	1	1	1		
CH10	1	0	0	1024	15	2	4	0	0	1	4000	0	0	0		
CH11	1	0	0	1024	15	2	4	0	0	1	4000	0	0	0		
CH12	1	0	0	1024	15	2	4	0	0	1	4000	0	0	0		
CH13	1	0	0	1024	15	2	4	0	0	1	4000	0	0	0		
CH14	1	0	0	1024	15	2	4	0	0	1	4000	0	0	0		
CH15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

# Herramientas de Registro, Catalogación y Monitorización remota.

## Catálogo de ficheros de análisis: NEXT FileCatalog

NEXT FILE CATALOG														next			
Q Search		C All data		next logout													
Show 25 ▾ entries														Run number: <input type="text"/>			
Analysis																	
Data Type	Source	Pressure	Run Number.	Cath. Voltage	Gate Voltage	Total Events	Start Date	End Date	eLog	Comments							
DATA	Kr-83	7,17	4734	-27.999,00	-7.000,00	2.687.872	07-10-2017 11:27:46	10-10-2017 10:37:57									
Analysis Type	Author	Release Number	Production	Events	Total Files	Total Size(GB)	Event Size(KB)	t/ev(s)	Conf. 1	Conf. 2	Location	Start Date	End Date	Comments	NID		
▼ RAWDATA	DATE	date-7.65-1	NEXT-NEW	2.687.872	31.622	14.746,30	5.752,74	0,10				07-10-2017 11:27:46	10-10-2017 10:37:57		88		
▼ HDF5	shifter			2.687.690	15.811	4.301,95	1.678,25	1,98				07-10-2017 11:39:34	10-10-2017 10:54:23		89		
▼ PMAPS	icuser	v0.9.1-20171107_prod	IC	2.687.180	226	9,84	3,84	1,87				09-11-2017 16:06:26	11-11-2017 04:03:21		90		
KDST	icuser	v0.9.3-20171109_prod	IC	1.872.815	1	0,18	0,07	0,00				14-11-2017 18:40:12	14-11-2017 22:12:42		91		
DATA	Kr-83	7,16	4730	-27.999,00	-7.000,00	1.720.334	29-09-2017 20:26:17	01-10-2017 17:13:49									
DATA	Kr-83	7,18	4708	-27.999,00	-7.000,00	1.177.118	21-09-2017 13:08:30	22-09-2017 19:12:52									
DATA	Kr-83	7,18	4699	-27.999,00	-7.000,00	1.751.771	19-09-2017 14:39:51	21-09-2017 11:08:41									
DATA	Kr-83	7,18	4628	-27.999,00	-7.000,00	2.443.901	07-09-2017 20:44:21	11-09-2017 09:57:55									
MC	EnrichedXe	0,00													BKG studies		
MC	DepletedXe	0,00													Bi(MC)		
MC	Co-56 (Lat. port)	0,00															
MC	Na-22 (Lat. port)	7,00															
MC	Kr-83	7,00															
DATA	Kr-83	7,03	2991	-21.499,00	-6.500,00	821.998	17-11-2017 16:45:08	26-11-2016 22:59:50									
DATA	Kr-83	7,03	2990	-21.499,00	-6.500,00	80.245	17-11-2017 16:45:11	26-11-2016 12:02:02									
DATA	Kr-83	7,03	2989	-21.499,00	-6.500,00	43.172	17-11-2017 16:45:14	26-11-2016 10:48:50									
DATA	Kr-83	7,03	2987	-21.500,00	-6.500,00	85.047	17-11-2017 16:45:17	26-11-2016 09:16:05									
DATA	Kr-83	7,03	2986	-21.499,00	-6.500,00	145.595	17-11-2017 16:45:20	26-11-2016 08:07:09									
DATA	Kr-83	7,03	2985	-21.500,00	-6.500,00	174.956	17-11-2017 16:45:23	26-11-2016 06:07:46									
DATA	Kr-83	7,03	2984	-21.499,00	-6.500,00	336.804	17-11-2017 16:45:25	26-11-2016 03:46:35									
DATA	Kr-83	7,03	2982	-21.499,00	-6.500,00	4.682	17-11-2017 16:45:27	24-11-2016 14:29:23									
DATA	Kr-83	0,00	2981	0,00	0,00	1.379.533	23-11-2016 20:12:56	24-11-2016 14:19:34									
DATA	Kr-83	0,00	2980	0,00	0,00	381.992	23-11-2016 14:14:50	23-11-2016 19:31:53									
DATA	Kr-83	0,00	2977	0,00	0,00	10.400	23-11-2016 12:18:17	23-11-2016 12:42:43									
DATA	Kr-83	0,00	2976	0,00	0,00	12.069	23-11-2016 11:49:07	23-11-2016 12:15:01									
DATA	Kr-83	7,03	2983	-21.499,00	-6.500,00	2.526.034	17-11-2017 16:45:39	25-11-2016 23:25:21									
Data Type	Source	Pressure	Run Number.	Voltage Cathode	Voltage Gate	Total Events	Start Date	End Date	eLog	Comments							

# Herramientas de Registro, Catalogación y Monitorización y Administración remota.

## Monitorización remota de los equipos: Nagios, Ganglia, VNC, IPMI – iKVM.

**©next DAQ/DATE Monitoring - 12/03/2018 18:29:47**

**Current RUN Status:**

Run Number	5375
Status	STARTED
Start Time	12/03/2018 18:28:06
End Time	
Last Update Time	12/03/2018 18:29:07
Duration (seconds)	60

**Hardware Conditions (12/03/2018 18:28:06):**

Temperature (C°)	41.83
Pressure (bar)	10.14
Voltage Cathode (volts)	3.53
Voltage Gate (volts)	-0.98

**Current Trigger/Event Rate**

Avg. Trigger Rate (Hz)	6.700
Total Events	402

**Current Storage Status**

Bytes Recorded	3.76 GB
Recording Bitrate	64.21 MB/s
Recording Enabled	YES
Analysis Disk Used	14% [87T free]
Raw Data Disk Used	49% [102T free]
Max. Recording Time	19.14 days.

**Trigger Parameters:**

Trigger Mask	ON
Auto External Trigger	ON
External Trigger	ON
Trigger Frequency (Hz)	10

**REFRESH**

**Current Network Status**

Last Updated: Mon Mar 12 17:34:06 CET 2018  
 Nagios® Core™ 3.5.1 - www.nagios.org  
 Logged in as nagiosadmin

**Host Status Totals**

Up	0	0	Unreachable	Pending
13	0	0	0	0

**Service Status Totals**

Ok	75	1	0	0	Critical	Pending
Warning	0	0	0	0	Unknown	0
Unknown	0	0	0	0	0	0
Pending	0	0	0	0	0	0

**Service Status Details For All Hosts**

Host	Service	Status	Last Check	Duration	Attempt	Status Information
analysis1next	Current Load	OK	03-12-2018 17:27:06	32d 1h 17m 0s	1/3	OK - load average: 21.23, 22.39, 23.66
analysis1next	PING	OK	03-12-2018 17:30:47	32d 0h 23m 19s	1/3	PING OK - Packet loss = 0%, RTA = 0.26 ms
analysis1next	SSH	OK	03-12-2018 17:32:28	32d 1h 11m 38s	1/3	SSH OK - OpenSSH_5.3 (protocol 2.0)
analysis1next	Space in Disk /data0	OK	03-12-2018 17:28:09	13d 18h 45m 57s	1/3	DISK OK - free space: / 1.6895 MB (15% inode=84%)
analysis1next	System Status	OK	03-12-2018 17:29:51	32d 0h 19m 16s	1/3	OK [31.0 °C.]
frontend1next	Current Load	OK	03-12-2018 17:25:31	32d 4h 28m 35s	1/3	OK - load average: 0.55, 0.46, 0.39
frontend1next	PING	OK	03-12-2018 17:27:12	32d 4h 26m 54s	1/3	PING OK - Packet loss = 0%, RTA = 0.28 ms
frontend1next	RAID Disk	OK	03-12-2018 16:49:16	11d 15h 44m 50s	1/3	OK - Checked 4 arrays.
frontend1next	SSH	OK	03-12-2018 17:28:57	32d 4h 25m 9s	1/3	SSH OK - OpenSSH_5.3 (protocol 2.0)
frontend1next	Space in Disk /data0	OK	03-12-2018 17:32:37	32d 4h 31m 29s	1/3	DISK OK - free space: / 20285 MB (41% inode=94%)
frontend1next	System Status	OK	03-12-2018 17:32:18	32d 4h 26m 48s	1/3	OK [23.0 °C.]
gdc1next	Current Load	OK	03-12-2018 17:35:59	32d 3h 20m 7s	1/3	OK - load average: 0.00, 0.00, 0.00
gdc1next	NEXT services	OK	03-12-2018 17:25:41	13d 4h 18m 26s	1/3	OK
gdc1next	PING	OK	03-12-2018 17:29:23	32d 3h 54m 45s	1/3	PING OK - Packet loss = 0%, RTA = 0.29 ms
gdc1next	SSH	OK	03-12-2018 17:29:25	32d 3h 54m 41s	1/3	SSH OK - OpenSSH_5.3 (protocol 2.0)
gdc1next	Space in Disk /data0	OK	03-12-2018 17:29:06	32d 3h 55m 0s	1/3	DISK OK - free space: /data0 1857506 MB (99% inode=99%)
gdc1next	System Status	OK	03-12-2018 17:33:28	32d 3h 25m 38s	1/3	DISK OK - free space: /data0 1857506 MB (99% inode=99%)
gdc2next	Current Load	OK	03-12-2018 17:26:09	32d 3h 27m 57s	1/3	OK - load average: 0.00, 0.00, 0.00
gdc2next	NEXT services	OK	03-12-2018 17:25:49	13d 4h 18m 17s	1/3	OK

**©next DAQ/DATE Monitoring - 12/03/2018 18:29:47**

**Host** **Service** **Status** **Last Check** **Duration** **Attempt** **Status Information**

**Host Status Details For All Hosts**

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analysis1next	Current Load	OK	03-12-2018 17:27:06	32d 1h 17m 0s	1/3	OK - load average: 21.23, 22.39, 23.66
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analysis1next	Space in Disk /data0	OK	03-12-2018 17:28:09	13d 18h 45m 57s	1/3	DISK OK - free space: / 1.6895 MB (15% inode=84%)
analysis1next	System Status	OK	03-12-2018 17:29:51	32d 0h 19m 16s	1/3	OK [31.0 °C.]
frontend1next	Current Load	OK	03-12-2018 17:25:31	32d 4h 28m 35s	1/3	OK - load average: 0.55, 0.46, 0.39
frontend1next	PING	OK	03-12-2018 17:27:12	32d 4h 26m 54s	1/3	PING OK - Packet loss = 0%, RTA = 0.28 ms
frontend1next	RAID Disk	OK	03-12-2018 16:49:16	11d 15h 44m 50s	1/3	OK - Checked 4 arrays.
frontend1next	SSH	OK	03-12-2018 17:28:57	32d 4h 25m 9s	1/3	SSH OK - OpenSSH_5.3 (protocol 2.0)
frontend1next	Space in Disk /data0	OK	03-12-2018 17:32:37	32d 4h 31m 29s	1/3	DISK OK - free space: / 20285 MB (41% inode=94%)
frontend1next	System Status	OK	03-12-2018 17:32:18	32d 4h 26m 48s	1/3	OK [23.0 °C.]
gdc1next	Current Load	OK	03-12-2018 17:35:59	32d 3h 20m 7s	1/3	OK - load average: 0.00, 0.00, 0.00
gdc1next	NEXT services	OK	03-12-2018 17:25:41	13d 4h 18m 26s	1/3	OK
gdc1next	PING	OK	03-12-2018 17:29:23	32d 3h 54m 45s	1/3	PING OK - Packet loss = 0%, RTA = 0.29 ms
gdc1next	SSH	OK	03-12-2018 17:29:25	32d 3h 54m 41s	1/3	SSH OK - OpenSSH_5.3 (protocol 2.0)
gdc1next	Space in Disk /data0	OK	03-12-2018 17:29:06	32d 3h 55m 0s	1/3	DISK OK - free space: /data0 1857506 MB (99% inode=99%)
gdc1next	System Status	OK	03-12-2018 17:33:28	32d 3h 25m 38s	1/3	DISK OK - free space: /data0 1857506 MB (99% inode=99%)
gdc2next	Current Load	OK	03-12-2018 17:26:09	32d 3h 27m 57s	1/3	OK - load average: 0.00, 0.00, 0.00
gdc2next	NEXT services	OK	03-12-2018 17:25:49	13d 4h 18m 17s	1/3	OK

**Host** **Service** **Status** **Last Check** **Duration** **Attempt** **Status Information**

**Host Status Details For All Hosts**

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analysis1next	Current Load	OK	03-12-2018 17:27:06	32d 1h 17m 0s	1/3	OK - load average: 21.23, 22.39, 23.66
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frontend1next	System Status	OK	03-12-2018 17:32:18	32d 4h 26m 48s	1/3	OK [23.0 °C.]
gdc1next	Current Load	OK	03-12-2018 17:35:59	32d 3h 20m 7s	1/3	OK - load average: 0.00, 0.00, 0.00
gdc1next	NEXT services	OK	03-12-2018 17:25:41	13d 4h 18m 26s	1/3	OK
gdc1next	PING	OK	03-12-2018 17:29:23	32d 3h 54m 45s	1/3	PING OK - Packet loss = 0%, RTA = 0.29 ms
gdc1next	SSH	OK	03-12-2018 17:29:25	32d 3h 54m 41s	1/3	SSH OK - OpenSSH_5.3 (protocol 2.0)
gdc1next	Space in Disk /data0	OK	03-12-2018 17:29:06	32d 3h 55m 0s	1/3	DISK OK - free space: /data0 1857506 MB (99% inode=99%)
gdc1next	System Status	OK	03-12-2018 17:33:28	32d 3h 25m 38s	1/3	DISK OK - free space: /data0 1857506 MB (99% inode=99%)
gdc2next	Current Load	OK	03-12-2018 17:26:09	32d 3h 27m 57s	1/3	OK - load average: 0.00, 0.00, 0.00
gdc2next	NEXT services	OK	03-12-2018 17:25:49	13d 4h 18m 17s	1/3	OK

**Host** **Service** **Status** **Last Check** **Duration** **Attempt** **Status Information**

**Host Status Details For All Hosts**

Host	Service	Status	Last Check	Duration	Attempt	Status Information
analysis1next	Current Load	OK	03-12-2018 17:27:06	32d 1h 17m 0s	1/3	OK - load average: 21.23, 22.39, 23.66
analysis1next	PING	OK	03-12-2018 17:30:47	32d 0h 23m 19s	1/3	PING OK - Packet loss = 0%, RTA = 0.26 ms
analysis1next	SSH	OK	03-12-2018 17:32:28	32d 1h 11m 38s	1/3	SSH OK - OpenSSH_5.3 (protocol 2.0)
analysis1next	Space in Disk /data0	OK	03-12-2018 17:28:09	13d 18h 45m 57s	1/3	DISK OK - free space: / 1.6895 MB (15% inode=84%)
analysis1next	System Status	OK	03-12-2018 17:29:51	32d 0h 19m 16s	1/3	OK [31.0 °C.]
frontend1next	Current Load	OK	03-12-2018 17:25:31	32d 4h 28m 35s	1/3	OK - load average: 0.55, 0.46, 0.39
frontend1next	PING	OK	03-12-2018 17:27:12	32d 4h 26m 54s	1/3	PING OK - Packet loss = 0%, RTA = 0.28 ms
frontend1next	RAID Disk	OK	03-12-2018 16:49:16	11d 15h 44m 50s	1/3	OK - Checked 4 arrays.
frontend1next	SSH	OK	03-12-2018 17:28:57	32d 4h 25m 9s	1/3	SSH OK - OpenSSH_5.3 (protocol 2.0)
frontend1next	Space in Disk /data0	OK	03-12-2018 17:32:37	32d 4h 31m 29s	1/3	DISK OK - free space: / 20285 MB (41% inode=94%)
frontend1next	System Status	OK	03-12-2018 17:32:18	32d 4h 26m 48s	1/3	OK [23.0 °C.]
gdc1next	Current Load	OK	03-12-2018 17:35:59	32d 3h 20m 7s	1/3	OK - load average: 0.00, 0.00, 0.00
gdc1next	NEXT services	OK	03-12-2018 17:25:41	13d 4h 18m 26s	1/3	OK
gdc1next	PING	OK	03-12-2018 17:29:23	32d 3h 54m 45s	1/3	PING OK - Packet loss = 0%, RTA = 0.29 ms
gdc1next	SSH	OK	03-12-2018 17:29:25	32d 3h 54m 41s	1/3	SSH OK - OpenSSH_5.3 (protocol 2.0)
gdc1next	Space in Disk /data0	OK	03-12-2018 17:29:06	32d 3h 55m 0s	1/3	DISK OK - free space: /data0 1857506 MB (99% inode=99%)
gdc1next	System Status	OK	03-12-2018 17:33:28	32d 3h 25m 38s	1/3	DISK OK - free space: /data0 1857506 MB (99% inode=99%)
gdc2next	Current Load	OK	03-12-2018 17:26:09	32d 3h 27m 57s	1/3	OK - load average: 0.00, 0.00, 0.00
gdc2next	NEXT services	OK	03-12-2018 17:25:49	13d 4h 18m 17s	1/3	OK

**Host** **Service** **Status** **Last Check** **Duration** **Attempt** **Status Information**

**Host Status Details For All Hosts**

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analysis1next	Current Load	OK	03-12-2018 17:27:06	32d 1h 17m 0s	1/3	OK - load average: 21.23, 22.39, 23.66
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gdc1next	System Status	OK	03-12-2018 17:33:28	32d 3h 25m 38s	1/3	DISK OK - free space: /data0 1857506 MB (99% inode=99%)
gdc2next	Current Load	OK	03-12-2018 17:26:09	32d 3h 27m 57s	1/3	OK - load average: 0.00, 0.00, 0.00
gdc2next	NEXT services	OK	03-12-2018 17:25:49	13d 4h 18m 17s	1/3	OK

**Host** **Service** **Status** **Last Check** **Duration** **Attempt** **Status Information**

**Host Status Details For All Hosts**

Host	Service	Status	Last Check	Duration	Attempt	Status Information
analysis1next	Current Load	OK	03-12-2018 17:27:06	32d 1h 17m 0s	1/3	OK - load average: 21.23, 22.

# Otros tipos análisis. Recursos IFIC/CERN

- Simulaciones del detector: Montecarlo.

## 1. GRID IFIC (100 cores)

- ## • Cálculo de la deposición de energía.

- Simulación de las Waveforms del detector.

- ## 2. CERN (100TB y 1000 cores)

## 2. CERN (100TB y 1000 cores)

- Se añade la información “True” + Ruido simulado + Shaping de la señal de la electrónica.

- Fase de análisis con el software: NEXT

- # - Comportamiento de la electrónica (módulo DIOMIR)

33-028-12 Buco de pieza S1 y S2 en waveforms (controles primarios)

808 82012998 041498186 44 26441517385 715830 12574 970 43 808 82012998 041498186 44 26441517385 715830 12574 970 43 808 82012998

## - Energía, posición y tiempo del evento.

### 3. Neutrinos1 (55 TB, 128 threads)

- ## • Estudios finales de discriminación entre signal y background

Deep Le  
62 52534 637936



Seviuor 4 GPUs. 2 x GeForce Titan X Pascal + 2 x GeForce 1080 Ti

# NEXT-100

- A partir de 2019 instalación en el LSC.
- Incremento del número de sensores respecto a NEXT-NEW → Incremento del volumen de datos generados.
- GlusterFS ?, Lustre ?, CEPH ?
- Separar DAQ (LSC) de cálculo / almacenamiento en edificio externo.

	NEXT-NEW	NEXT-100
ATCA: número de links	12	30
ATCA: ancho de banda	140MB/s	480MB/s
Número LDCs	3	5
Número de GDCs	2	4
Almacenamiento: tamaño	300TB	600TB
Almacenamiento: nodos	3	5
Cálculo: número cores	150	300

# Computing en NEXT

## Fin / Preguntas