



BTF status and upgrade





BTF staff & upgrade team



BTF scientific staff

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Upgrade extended team

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INFN Laboratori Nazionali di Frascati and *INFN Roma





BTF 2015

- Start of activities delayed: from Jan. to Mar. and from Sep. to Oct. for BTF improvements (shielding, upgrade of control system, new control room)
- 175 beam-days overall

Completely dismantled experimental hall (Summer 2015)







Start	End	User	Group	Rollin/out	beam	dose	Min.	Max. Energy	Particle	Min. Mult	Max. Mult.	Info	Prior
2015-03-09	2015-03-23	BTF-CHAOS	Luca Foggetta	6	14	0.0	500.0	500.0	Electron	1.0	1000.0	CHAOS test with BEAM	Main user
2015-03-23	2015-03-30	MIMOSA	Spiriti Eleuterio	6	7	0.0	500.0	500.0	Electron	1.0	1000.0	Dovendo ALICE valutare i riseltati dei test in primavera si richiede il periodo possibilmente nella seconda meta di marzo.	Main user
2015-03-30	2015-04-06	BTFstaff	Eacle Volente	0	20	0.0	500.0	500.0	licenn	1.0	1000.0	NTF test and maintenance	Main user
2015-04-06	2015-04-13	MU2E	Ivano Sarra	6	7	0.0	100.0	500.0	Electron	1.0	3.0	Test to be carried out before the Technology Review of the experiment that will be done at beginning of May 2015.	Main
2015-04-13	2015-04-20	CRYSBEAM	G.Cavoto	6	7	0.0	500.0	500.0	Electron	1.0	1.e+4		Main
2015-04-20	2015-04-27	3D-SOD	Leonello Servoli	6	7	0.0	500.0	500.0	Electron	1.0	1000.0	The request is to test Silicon on Diamond detectors for MIP detection and grazing angle measurements.	Main
2015-04-27	2015-05-04	BTEMAT	Paolo	6	7	0.0	500.0	500.0	Electron	ID	1000.0	WTF test and maintenance	Main
2015-05-04	2015-05-11	PADME	Mauro Raggi	6	7	0.0	500.0	500.0	Electron	1.0	1.e+5	Test of PADME calorimeter prototypes, LYSO and/or BGO Background measurements with thin scattering targets (e.g. 1 mm tangsten) in the range 10^3- 10^5 particles/pulse	Main user
2015-05-11	2015-05-18	ІМСР	Paolo Meridiani	6	7	0.0	500.0	500.0	Electron	1.0	100.0		Main
2015-05-18	2015-05-25	PADME	Mauro Raggi	6	7	0.0	500.0	500.0	Electron	1.0	1.e+5	Test of PADME calorimeter prototypes, LYSO and/or BGO Background measurements with thin scattering targets (e.g. 1 mm tangsten) in the range 10^3- 10^5 particles/pulse	Main user
2015-05-25	2015-06-01	MIMOSA	Spiriti Eleuterio	6	7	0.0	500.0	500.0	Electron	1.0	1000.0	Final test before submission	Main user
2015-06-01	2015-06-08	PADME	Mauro Raggi	6	7	0.0	500.0	500.0	Electron	1.0	1.e+5	Test of PADME calorimeter prototypes, LYSO and/or BGO Background measurements with thin scattering targets (e.g. 1 mm tangsten) in the range 10^3- 10^5 particles/pulse	Main user
2015-06-08	2015-06-15	BTFstaff	Pacto	0	7	0.0	500.0	500.0	Electron	1.0	1000.0	Plant maintenance	Main
2015-06-15	2015-06-22	SIDDHARTA/AMADEU	Catalina Petrascu	6	7	0.0	500.0	500.0	Electron	1.0	1000.0		Main
2015-06-22	2015-06-29	BTFstaff	Paolo Valente	6	7	0.0	500.0	500.0	Electron	1.0	1000.0	Test dei rivelatori a Pixel da installare come tracciatore alla BTF. (Pixel Tracker)	Main
2015-06-29	2015-07-06	TARI-54	S. Petrovic	6	7	0.0	50.0	500.0	Electron	1.0	1000.0	BTF GEM TPC and vacuum support required	Cancel
2015-07-06	2015-07-13	JLAB12-Rome	Guido Maria Urciuoli	6	7	0.0	50.0	500.0	Electron	1.0	1000.0	The beam is requested to test silcon microstrip detectors to be installed as front part of the tracker of the SBS spectrometer to be installed in the experimental Hall A of [Lab in Newport News, Virginia USA. The silicon microstrip detector construction i	Main user
2015-10-05	2015-10-12	CRYSBEAM	G.Cavoto	6	7	0.0	500.0	500.0	Electron	1.0	1.0+4		Main user
2015-10-12	2015-10-19	FTRB_CluCount	Erancesco Renga	6	7	0.0	500.0	500.0	Electron	1.0	100.0	Calorimeter - High Voltage system - 2 gas lines (Helium - Isobutane)	Main
2015-10-19	2015-11-02	EDIT2015	Ivano Sarra	6	14	0.0	500.0	500.0	Electron	1.0	1000.0	Per ora vorremmo solo riservare lo slot. Per le caratteristiche del fascio ed eventuali necessità integreremo la richiesta nel seguito	Main
2015-11-02	2015-11-09	M-SOD	Leoneba	0	7	0.0	500.0	500.0	Decres	1.0	1000.0	The request is to test Silicon on Diamond detectors for MIP detection and graving multi-measurements.	Cancel
2015-11-09	2015-11-16	MONDO	Michela Marafini	40	7	2.0	500.0	500.0	Electron	1.0	10.0	HV, Gas System	Main
2015-11-16	2015-11-30	PADME	Mauro Razgi	6	14	0.0	500.0	500.0	Electron	1.0	1000.0	Test of PADME calorimeter prototypes together with a first spectrometer prototype 10*3-10*5 particles/pulse positron required (reduced to 2 weeks)	Main user
2015-11-30	2015-12-07	NEURAPID	Bedogni	3	7	0.0	500.0	500.0	Electron	1.0	1000.0	TESTING SP2 spectrometer with n@BTF target at 90° in high-intensity	Main
2015-12-07	2015-12-14	ns	Paolo Martinengo	6	7	0.0	500.0	500.0	Electron	1.0	1000.0	In the framework of the upgrade of the ALJCE experiment at LHC, the upgrade of the Inner Tracking System (ITS) plays a key role. The new ITS will consist of 7 layers of Monolithic Active Pixel Sensors. A second full scale (30mmx15mm) prototype has been	Main user
2015-12-14	2015-12-21	3D-SOD	Leonello Servoli	6	7	0.0	500.0	500.0	Electron	1.0	1000.0	The request is to test Silicon on Diamond detectors for MIP detection and grazing angle measurements.	Main user



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BTF 2016



January-July:

- 2 development shifts
- 1 safety qualification stop
- 1 maintenance week
- 1 CHAOS-BTF joint shift
- 18 users slots

Up to mid June:

#160 users (with double counting)

\wedge	Start	End	User	Group Leader	Rollin/out (h)	beam (days)	dose	Mis. Energy	Max. Energy	Particle	Min. Mult.	Max. Mult.	Info	Priority
13	2016-01-11	2016-01-25	BTF-CHAOS	Loca Eccentia	6	14	0.0	250.0	500.0	Electron	1.0	1000.0	Upgrade to CHAOS of BTF control system	Main user
,	2016-01-25	2016-02-01	BTFood	Paolo Valente	6	7	0.0	500.0	500.0	Ulectron	10	1000.0	Plant maintenance	Main
	2016-02-01	2016-02-08	INSUB	Michela Prest	6	7	0.0	100.0	500.0	Electron	1.0	100.0	la collaborazione con l'Università dell'Insubria *RECUPERO*	Main
	2016-02-08	2016-02-15	ns	Paolo	6	7	0.0	500.0	500.0	Electron	1.0	1000.0		Main
1.ev	2016-02-15	2016-02-22	tof_diamonds	Roberto Cardarelli	6	7	0.0	500.0	750.0	Electron	1.0	1000.0		Main
	2016-02-22	2016-02-29	BTFstaff	Paolo Valente	6	7	0.0	500.0	500.0	Electron	1.0	1000.0	BTF staff measurements	Main user
	2016-02-29	2016-03-07	GMINUS2	Antonio Anastasi	6	7	0.0	300.0	500.0	Electron	1.0	1000.0		Main
	2016-03-01	2016-03-08	PADME	Maaro Ranzi	6	7	0.0	0.001	600.0	Postron	1.0	12+4	Test of the PADME Ecal and target	Main
	2016-03-07	2016-03-14	MEMOSA	Spiriti Elesterio	6	7	0.0	500.0	500.0	Electron	1.0	1.0+4	Si propone una misura di caratterizzazione del Timepix3 per applicazione in PADME cencando di risolvere la struttara temporale del bunch della BTF fino a 10e4 elettroni per bunch.	Main user
· A	2016-03-07	2016-03-14	VIRHIS	Massimo Zambelli	6	7	0.0	27.0	27.0	Electron	10	1000.0		Main
N	2016-03-14	2016-03-21	NRTUNRCA	Antonino Pietropaolo	8	7	0.0	500.0	500.0	Electron	1.0	1000.0		Main
	2016-03-21	2016-03-28	BTFstaff	Paolo Valente	6	7	0.0	500.0	500.0	Electron	1.0	1000.0	BTF staff measurements at high intensity	Main
	2016-03-28	2016-04-04	CRYSBEAM	G.Cavote	6	7	0.0	500.0	500.0	Electron	1.0	1.e+4	Diamond with Medipix readout	Main user
	2016-04-04	2016-04-11	PADME	Mauro Razzi	6	7	0.0	100.0	600.0	Positron	1.0	1.e+4	Test of the PADME Ecal and target	Main user
	2016-04-11	2016-04-18	MIMOSA	Spiriti Elesterio	6	7	0.0	500.0	500.0	Electron	1.0	1000.0	Test rivelatori a piael monolitici per ALICE	Main user
RPY	2016-04-11	2016-04-18	NITEC	Elisabetta Baracchini	6	7	0.0	500.0	500.0	Electron	1.0	1000.0	We are going to test the response, calibrate and characterize a small prototype TPC with 5 cm drift distance equipped with GilMPx readout with different gas mixtures at various pressure below 1 atm, both in conversional electrom-carrier configuration and	Main user
	2016-04-18	2016-04-25	RTEMAT	Packe	6	7	0.0	500.0	5000	Electron	10	1000.0	Safety qualification.	Main
	2016-04-25	2016-05-02	LIMADOU	BRUNO SPATARO	8	7	10.0	25.0	120.0	Electron	1.0	1000.0	Dimensions of the HEPD calorimeter: 55 cm x 40 cm x 40 cm	Main user
	2016-05-02	2016-05-09	edman	Roberto Messi	6	7	0.0	500.0	500.0	Electron	1.0	1000.0	test per il rivelatore MPRC	Main user
	2016-05-09	2016-05-16	MONDO	Michela Marafini	25	7	0.0	50.0	500.0	Electron	1.0	100.0		Main
101	2016-05-09	2016-05-16	VIRHIS	Massimo Zambelli	6	7	0.0	27.0	27.0	Electron	1.0	1000.0		Main
4.	2016-05-16	2016-05-23	3D-SOD	Leonello Servoli	6	7	0.0	500.0	500.0	Electron	1.0	1000.0	Test of Silicon-On-Diamond devices.	Main user
	2016-05-23	2016-05-30	BTFstaff	Packs Valente	6	T	0.0	500.0	500.0	Electron	10	1000.0	Maintenance	Main
	2016-05-30	2016-06-06	IMCP	Paolo Meridiani	6	7	50.0	500.0	500.0	Electron	1.0	100.0		Main user
\sim	2016-06-06	2016-06-13	FIRB_CluCount	L'INDERCO Renga	6	7	50.0	500.0	500.0	Electron	1.0	1000.0		Main
Maini	2016-06-13	2016-06-20	BTFstaff	Paolo Valente	6	7	0.0	500.0	500.0	Electron	1.0	1000.0	Reserved	Main user
all .	2016-06-20	2016-06-27	SIDDHARTA/AMADEU	Catalina Petrascu	6	7	0.0	500.0	500.0	Electron	1.0	1000.0		Main user
	2016-06-27	2016-07-11	PADME	Master Reggi	6	14	0.0	100.0	600.0	Positron	1.0	1000.0	Test of the PADME target and ECAL	Main user
	2016-07-04	2016-07-11	MU2E	Ivana Sana	6	7	0.0	60.0	140.0	Dectors	10	2.0	We need good hears energy spread at 100 MeV ***CANCELLED, to be rescheduled***	Main
101	2016-07-11	2016-07-16	BTFstaff	Paolo Valente	6	5	0.0	500.0	500.0	Electron	1.0	1000.0	Reserved for BTF	Main
	2016-07-17	2016-09-11	BTFstaff	Paolo	6	56	0.0	500.0	500.0	Electron	10	1000.0	Summer shutdawa	Main





BTF 2016

September-December:

- 2 pre-booked shifts
- 1 safety qualification week
- 1 development shift
- 18 weeks new requests

BTF BTF

s	tart	End	User	Group Leader	Rollin/out	beam (days)	dose	Min. Energy	Max. Energy	Particle	Min. Mult.	Max. Mult.	Info	Priority
2016	07-17	2016-09-11	BTFstaff	Paolo Valente	6	56	0.0	500.0	500.0	Electron	1.0	1000.0	Summer shutdown	Main user
2016	09-05	2016-09-12	месн	<u>Paolo</u> Walter Cattaneo	6	7	0.0	50.0	100.0	Electron	999.9	1.e+7		Main user
2016-	-09-06	2016-09-13	CALOCUBE	<u>Oscar</u> Adriani	6	7	999.9	200.0	500.0	Electron	1.0	1000.0	CALOCUBE can work also with positron in case of necessity We can perform our beam test also with different start period.	Main user
2016	09-09	2016-09-16	3D-SOD	Leonello Servoli	6	7	0.0	500.0	500.0	Electron	1.0	1000.0	test of 3D diamond detectors.	Main user
2016	-09-12	2016-09-19	BTFstaff	Paolo Valente	6	7	0.0	500.0	500.0	Electron	1.0	1000.0	Restart BTF and test	Main user
2016	10-01	2016-10-15	PADME	<u>Mauro</u> <u>Raggi</u>	6	14	0.0	100.0	500.0	Positron	1.0	1.e+4	Test of the PAMDE Ecal target and Vetos	Main user
2016-	10-02	2016-10-09	OptoTracker	Andrea Celentano	6	7	0.0	500.0	500.0	Electron	1.0	1.0		Main user
2016-	10-03	2016-10-10	CRYSBEAM	G.Cavoto	6	7	0.0	500.0	500.0	Electron	1.0	1.e+4	Test and calibration of new Cherenkov radiators	Main user
2016	10-03	2016-10-10	IDF	Paolo Valente	6	7	0.0	100.0	500.0	Electron	100.0	1000.0	Incontri di Fisica	Main user
2016-	10-03	2016-10-10	DCaNT	G.Cavoto	6	7	0.0	100.0	500.0	Electron	100.0	1000.0		Main user
2016	10-09	2016-10-16	MU2E	Ivano Sarra	6	7	0.0	60.0	140.0	Electron	1.0	2.0	We need good beam energy spread at 100 MeV	Main user
2016	10-10	2016-10-17	CMS-UP	<u>Livio Fano</u>	6	7	0.0	500.0	500.0	Electron	1.0	1000.0		Main user
2016	10-10	2016-10-17	JLAB12-Rome	<u>Guido</u> Maria Urciuoli	6	7	0.0	500.0	500.0	Electron	1.0	1000.0	The beam is requested to test silcon microstrip detectors to be installed as front part of the tracker of the SBS spectrometer to be installed in the experimental Hall A of JLab in Newport News, Virginia USA.	Main user
2016-	-10-10	2016-10-17	QWLS	Pasquale Lubrano	6	7	0.0	500.0	500.0	Electron	1.0	1000.0		Main user
2016-	-10-31	2016-11-07	CESR-dark	Jim Alexander	6	7	0.0	500.0	500.0	Electron	1.0	1000.0		Main user
2016	-11-14	2016-11-21	NITEC	Elisabetta Baracchini	6	7	0.0	500.0	500.0	Electron	1.0	1000.0	We are going to test the response, calibrate and characterize a full length TPC with 20 cm drift length equipped with GEMPix readout with different gas mixtures at various pressure below 1 atm, both in conventional electron-carrier configuration and ne	Main user
2016	11-28	2016-12-05	MIMOSA	<u>Spiriti</u> Eleuterio	6	7	0.0	500.0	500.0	Electron	1.0	1000.0	Test of a Plume ladder (about 12x2cm square double plane pixel tracker) and a Pegasus (pixel sensor for spectrometer application) prototype. For application in Hadrontherapy fragmentation measurements.	Main user
2016-	11-28	2016-12-05	FIRB_CluCount	Francesco Renga	6	7	50.0	500.0	500.0	Electron	1.0	1000.0		Main user
2016-	12-12	2016-12-19	ITS	Paolo Martinengo	1	7	0.0	500.0	500.0	Electron	1.0	1000.0		Main user
2016	12-12	2016-12-19	DCaNT	G.Cavoto	6	7	0.0	100.0	500.0	Electron	100.0	1000.0		Main user

- Projected overall 2016: 40 requested/26 delivered
- ≈240 beam-days
- 150% request/delivered ratio



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Highlights 2016: ALICE ITS





pALPIDE chip for ALICE ITS upgrade complete characterization





ALPIDE2 testbeam measurement, 25 µm epitaxial layer, -6V back bias, before and after irradiation



Excellent performance also after irradiation to 1013 (1MeV n_{ex})/cm²



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Highlights 2016: LIMADOU





Test of High Energy Particle Detector (HEPD), for low energy electrons (3-100 MeV), protons (30-200 MeV) and light nuclei with high angular and energy resolution: LYSO calorimeter + Si micro-strip detectors

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Highlights 2016: improved diagnostics

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Calorimeter automatic calibration & range adjustment



FitPIX data real-time retrieval in Memcached distributed memory

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BTF upgrades Conceptual Design Report released

	INFN Intellete Reamonate of Fooda Nucleare
-172	
Linear Accelera	tor Test Facility al Design Report

0	INTRODUCTION	4
1	PRESENT SITUATION	5
1.1	The Frascati accelerator complex	
1.2	LINAC	
1.3	Beam Test Facility, BTF	
1	3.1 Single particle production and high intensity	11
1	3.2 BTF operation	13
1	.3.3 BTF line and experimental hall	
1	3.4 BTF diagnostics and beam parameters	
1	3.5 BTF Users	24
2	MOTIVATIONS AND REQUIREMENTS	27
2.1	Electron and positron Beam-Test activities	
2.2	Tagged photon source	
2.3	Neutron source	
2.4	Electron and positron fundamental physics experiments	
2	.4.1 The PADME experiment	31
2	4.2 Channeling experiments	
2.5	Electron Irradiation	
3	PROJECT DESCRIPTION	
3.1	LINAC modulators consolidation	
3.2	LINAC energy upgrade	
3.3	New beam lines	
4	COSTS AND PLANNING	63
4.1	Summary of costs	
4.2	Planning	
4.3	Human resources	

Frascati Linac Test Facility



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Second line: from idea to optics



Shielding and control room











Second line: from idea to optics









Second beam-line: layout





Second beam-line layout



Very little or no impact on DAFNE collider operations:

- DAFNE damping ring and timing racks stay untouched
- Minimal intervention in LINAC tunnel





Second beam-line: radiation studies





Add beam-dump and 30 cm concrete roof



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Second beam-line: radiation studies

10⁻⁷ pSv/e- correspond to 10 µSv/year at 10⁵ e-/bunch × 50 Hz × 2·10⁷ s



O. Frasciello



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Upgrade(s): LINAC consolidation



Aiming at general consolidation of the LINAC, in order to allow safe and efficient operations in the next 5-10 years, in **particular updating the RF power stations (modulators).** More specifically:

- Upgrade of the PFN charge circuit with new generation HV PS
- New supplies for core bias & filament
- Replace (simplify and improve) the interlock system, now totally analogic (with some home-made components and frequent faults); new FPGA-based system, tailored to our modulator
- New signal readout and digital I/O, now on CAMAC bus
 - As a consequence, new control system
- Diagnostics upgrade: digitizer & DAQ for the BPM's
- Upgrade gun pulser

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Consolidations of thermalizing circuits









Upgrades(s): pulse width extension



- New pulser for LINAC gun ordered in 2015. Delivery due in May
- Adds to 1.5 40 ns (0.5 ns steps) the range 50-5000 ns (50 ns steps)
- **Fully compatible with existing hardware** and only minor modifications to software
- Installation and tests by restart of the LINAC in September
- Crucial for PADME! Luminosity increases linearly with pulse duration, since it increases the number of positrons in the beam while keeping the pile-up probability in the detector constant



40 ns



Electrons at nominal energy emitted from the gun without pulsing, detected in the BTF calorimeter

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- Indication that phase differences
 among the four modulators allow
 accelerating with good energy
 spread in the 150-200 ns range
 already in the present configuration,
 without modifying the RF system.
- In addition, with multiple phase inversions of PSK, it should be possible to further extend the pulse





New electron gun pulser specs

Kentech Special Pulser	
Amplitude	from -300 to -1000V in steps of 50V
Pulse shape	Rectangular
Pulse width	1.5ns to 5 μsecs, FWHM
Rise time	<1ns (both modes)
Fall time	<1.5ns for PW <=45ns (short pulse mode) 8ns for PW >45ns (long pulse mode)
Maximum rep rate	>= 50Hz
Start jitter	20ps rms
PW jitter	20ps rms for PW <=45ns 500ps for PW > 45ns
Flatness	+/-10%
Post pulse noise	+/-10%









lazionale Nucleare

RPM

Upgrade(s): control & timing

Hardware and software refurbishing already under way:

New digitizer and multiplexer (PXI) for BPM readout

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BTF upgrade(s): high resolution telescope

Three main goals:

- Provide the BTF users with a high granularity tracker with "negligible" material (to minimize multiple scattering at 500MeV electrons) as a reference detector for testing purposes.
- Provide the BTF with a tool for easily tuning the beam parameters.
- Characterization of the beam **bunch time structure** and composition (essential information for experiments like PADME).





Starting experience



FIRST (Fragmentation of Ions for Space and Therapy)

Vertex performance for tracking and dE/dx





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Sensors choice

BTF BTF

M₂8 pixel sensor

- MAPS (15 µm epitaxial layer)
- 50 µm thickness
- 928 (rows) x 960 (columns) pixels
- 20.7 µm pitch
- Size 20.22 mm x 22.71 mm
- chip readout time 185.6 µs
- Digital Zero Suppressed Output By IPHC – IN2P3 Strasbourg

Timepix3 pixel sensor

- Fully depleted bump-bonded sensor
- 256 (rows) x 256(columns) pixels
- 55.0 µm pitch
- Size 14.08 mm x 14.08 mm
- TOT (Time Over Threshold) 10 bits
- TOA (Time of Arrival) 1.56 ns LSB
- Fast Zero Suppressed output By CERN (Medipix3 collaboration)





BTF ready supports

Telescope readout



Simulated serial output of the M28 Mimosa sensor



Pixel sensors readout based on SoC (System on Chip) boards (Altera FPGA based)

- Preliminary DAQ version (Firmware/Software) based on Terasic Deo-Nano-SoC board running Linux
- Final version based on Terasic SoCKit Development Kit hosting the Altera FPGA Cyclone V SX SoC-5CSXFC6D6F31C6N (much larger resources available).

Gigabit Ethernet link



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BTF upgrade plan



Plan for 2016-2017 and 2018 sent to INFN management with priority for line doubling and modulator consolidation

Item	Ν.	Unit cost (k€)	Cost (k€)
New supplies for PFN charging	3	40	120
New supplies for PFN charging (existing modulators)	8	40	320
New readout system for LINAC signals	1	50	50
New modulator control system	1	100	100
New readout and DAQ for BPMs	1	50	50
New gun pulser 1 ns - 4.5 us	1	70	70
Secondary cooling upgrade for RF structure and SLED	1	100	100
Modulator	1	600	600
Klystron filament and core bias supplies	10	6	60
Total WP1			1470
1			

Item	N.	Unit cost (k€)	Cost (k€)
SLED	1	200	200
Klystron	1	200	200
Accelerating sections	4	100	400
Waveguide network	1	150	150
Quadrupoles (LINAC)	4	75	300
Correctors (LINAC)	8	10	80
Totale WP2			1330

Item	N.	Unit cost (k€)	Cost (k€)			
45° dipoles and power supplies	4	100	400			
Quadrupoles (new line)	6	70	420			
Correctors (new line)	3	10	30			
New shielding, civil engineering	160					
New collimators, supports, pipes	40					
Electrical systems upgrade			100			
Cooling systems upgrade	260					
Total WP3			1410			



Photon tagging upgrade



- Simulation porting to Geant4 ongoing
- Full (electron) beam characterization (divergence, beam spot) needed for realistic design of photon beam



BTF BTF



Detector studies on scintillation bars, with SiPM readout under way

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Magnetic field effect on readout electronics under way



Summary

BTF BTF

- The BTF upgrade program is proceeding in parallel with the operation of the facility
- Final details in the Conceptual Design Report
- The studies for the new beam-lines have been completed
 - Now releasing the specifications for magnet procurement
- Due to some delay in the overall funding, and the time needed for purchasing all the new line elements (in particular, new magnets)

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MS-34: New Frascati beam line components installed – M18

has to be moved forward (from M18 to M27)

Photon tagging upgrade progressing well





Spares









Revised plan (modulators consolidation)





Revised plan (modulators consolidation)

1	Title	8		T2 / 2017			T3 / 2017			T4/2017		T1 / 2018			
1			04	05	06	07	08	09	10	11	12	01	02	03	
1	2 🔻	WP1. Consolidamento	-				I								
13	3	Verifica carico circuito secondario LINAC	4												
14	4	Preparazione servizi installazione offline stazione RF													
1	5	Modifiche circuito raffreddamento secondario	1												
16	6	Specifiche alimentatori di carica PFN													
17	7	Specifiche modulatore	1												
14	8	Specifiche SLED + 3dB coupler	2												
19	9	Specifiche sistema di acquisizione LINAC	1												
2	0	Specifiche sistema di controllo LINAC	1												
2	1	Acquisto hardware sistema di acquisizione													
2	2	Acquisto hardware sistema di controllo					<u>+</u>								
2	3	Sviluppo software sistema di acquisizione	introlli 2; BTF 3												
2	4	Sviluppo software sistema di controllo					Co	ntrolli 1; Controlli 2;	LINAC 8						
2	5	Integrazione sistema di acquisizione			- o	ntrolli 1; Controlli 2; B	TF 2				_				
2	6	Integrazione sistema di controllo				ntegrazione sistema d	contr		1		Controlli 1	Controlli 2; BTF 2			
2	7	Acquisto alimentatori di carica PFN	LINAC 2												
2	8	Acquisto modulatore			UN	AC 1									
2	9	Acquisto SLED + 3dB coupler													
3	0	Acquisto componenti per stazione RF													
3	1	Installazione alimentatori di carica (stazione test)	2	LINAC 9											
3	2	Installazione modulatore offline	1	Installazione modulat	tore offline	UNAC 3; U	NAC 1; LINAC 2;								
3	3	Installazione klystron	1		Installazione klyst	n - U	AC 8; LINAC 3; LIN	IAC 4;							
3	4	Installazione SLED + 3dB coupler	2		Installazione SLED	+ 3dB co	UNAC 7; LINA	VC 8; LINAC 3;							
3	5	Installazione nuova stazione RF tunnel	1		Installazi	ne nuova stazione	UNAC 9-				_				
3	6	Commissioning stazione RF	2			Commissionin	stazione RF	LINAC 5;	LINAC 1; LINAC 2;	1					
3	7	Validazione nuovi alimentatori	1			Valic	lazione nuovi alimen	tatori							
3	8	Preparazione upgrade sistema di acquisizione e controllo LINAC							Prepar	azione upgrade sist				- LINAC 4; BTF 2; BTF 3	
3	9	Installazione nuovo sistema acquisizione e controllo LINAC												Installazione n	
4	0	Acquisto alimentatori di carica PFN (tutti)						Acquisto	alimentatori di caric	L					
4	1	Installazione alimentatori di carica (4 modulatori)	1							2	017		7	Installazione alle	
	B	TF_ BTF_	,ر ک	une 14th,	2016	DESY - 1	st AIDA	-2020 A	nnual M	leeting		A	ID	A ²⁰²⁰	



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Revised plan (modulators consolidation)

solidamento carico circuito secondario LINAC cone servizi installazione offline RF e circuito raffreddamento secondario he alimentatori di carica PFN he modulatore he SLED + 3dB coupler he sistema di acquisizione LINAC he sistema di acquisizione hardware sistema di acquisizione hardware sistema di controlio	4 04 1 1 2 1 1 1	05		06 07	08	09	10	11	12
solidamento sarico circuito secondario LINAC cione servizi installazione offline RF e circuito raffreddamento secondario ne alimentatori di carica PFN ne modulatore ne SLED + 3dB coupler ne sistema di acquisizione LINAC ne sistema di controllo LINAC nardware sistema di controllo	4		-						
arico circuito secondario LINAC cione servizi installazione offline RF e circuito raffreddamento secondario ne alimentatori di carica PFN ne modulatore ne SLED + 3dB coupler ne sistema di acquisizione LINAC ne sistema di acquisizione LINAC ne sistema di acquisizione nardware sistema di acquisizione nardware sistema di controllo	4								
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sontware sistema di acquisizione	_								1
software sistema di controllo									1
one sistema di acquisizione									
one sistema di controllo									10
alimentatori di carica PFN									100
modulatore									
SLED + 3dB coupler									
componenti per stazione RF									100
one alimentatori di carica (stazione	2								
one modulatore offline	1								
one klystron	1								8
one SLED + 3dB coupler	2								000
one nuova stazione RF tunnel	10								
sioning stazione RF	2	1		_					
ne nuovi alimentatori	3								8
tione upgrade sistema di acquisizione lo LINAC	; BTF 3; Cont								
one nuovo sistema acquisizione e LINAC	zione nuovo siste	ema	LINAC	4; Controlli 1; Controll	2				
alimentatori di carica PFN (tutti)		LINAC 1							
one alimentatori di carica (4 ori)	¹ one alimentatori	di c 🕞	- LINAC	4; LINAC 5; LINAC 6;.				ר	018
one one one one sion lo l one one one one one one one one one one	Imponenti per stazione RF a alimentatori di carica (stazione a modulatore offline a klystron a SLED + 3dB coupler a nuova stazione RF tunnel nuovi alimentatori le upgrade sistema di acquisizione UNAC a nuovo sistema acquisizione e NAC mentatori di carica PFN (tutti) a alimentatori di carica (4	Imponenti per stazione RF e alimentatori di carica (stazione 2 e modulatore offline 1 e klystron 1 e skipstron 2 e nuova stazione RF 1 ning stazione RF 2 nuovi alimentatori 1 e upgrade sistema di acquisizione 1 INAC ; BTF 3; Cont anuovo sistema acquisizione e VAC mentatori di carica (A 1 one alimentatori	mponenti per stazione RF e alimentatori di carica (stazione 2 e modulatore offline 1 e klystron 1 e skipstron 2 e nuova stazione RF tunnel ning stazione RF 2 nuovi alimentatori 1 e upgrade sistema di acquisizione i BTF 3; Cont e nuovo sistema acquisizione e alimentatori di carica (A 1 one alimentatori di c	Imponenti per stazione RF a alimentatori di carica (stazione 2 a modulatore offline 1 a klystron 1 a SLED + 3dB coupler 2 a nuova stazione RF tunnel ining stazione RF tunnel unvovi alimentatori u e upgrade sistema di acquisizione UNAC a nuovo sistema acquisizione e vAAC mentatori di carica PFN (tutti) a alimentatori di carica (4 1 one almentatori di c	Imponenti per stazione RF a alimentatori di carica (stazione 2 a modulatore offline 1 b klystron 1 b SLED + 3dB coupler 2 b nuova stazione RF 1 ning stazione RF 2 nuova stazione RF 2 UNAC b nuova statema di acquisizione 1 UNAC b nuovo sistema acquisizione e UNAC b nuovo sistema acquisizione e UNAC b nuovo sistema UNAC 4; controll 1; Controll 1; Controll 1; Controll 2; BTF 3; Cont UNAC 4; Controll 1; Controll 1; Controll 2; BTF 3; Cont 4; UNAC 4; UNAC 5; UNAC 6; 4; Controll 4; Contr	Imponenti per stazione RF a alimentatori di carica (stazione a modulatore offline b klystron b SLED + 3dB coupler	animentatori di carica (stazione 2 a modulatore offline 1 a kiystron 1 a kiystron 1 a SLED + 3dB coupler 2 a nuova stazione RF 1 a nuova sistema di acquisizione 1 uNAC 1 a nuovo sistema acquisizione e 20 uNAC 20 a nuovo sistema acquisizione e 20 unovo sistema acquisizione i <t< td=""><td>animentatori di carica (stazione RF a indultatore offline 1 a kiystron 1 a kiystron 1 a kuyatzone RF 2 a nuova stazione RF 2 3 SLED + 3dB coupler 2 a nuova stazione RF 2 a nuova stazione RF 2 a nuova sistema di acquisizione e 2 VAC a nuovo sistema</td><td>imponenti per stazione RF a inmentatori di carica (stazione a modulatore offline 1 a kiystron 1 a SLED + 3dB coupler 2 a nuova stazione RF tunnel ining stazione RF 2 a nuova sistema di acquisizione e 1 VAC a nuovo sistema 4 <</td></t<>	animentatori di carica (stazione RF a indultatore offline 1 a kiystron 1 a kiystron 1 a kuyatzone RF 2 a nuova stazione RF 2 3 SLED + 3dB coupler 2 a nuova stazione RF 2 a nuova stazione RF 2 a nuova sistema di acquisizione e 2 VAC a nuovo sistema	imponenti per stazione RF a inmentatori di carica (stazione a modulatore offline 1 a kiystron 1 a SLED + 3dB coupler 2 a nuova stazione RF tunnel ining stazione RF 2 a nuova sistema di acquisizione e 1 VAC a nuovo sistema 4 <



Revised plan (new beam-lines)

•	Title	T1 / 2016	3	te devile de tierde de Az de	T2 / 2016	and a second		T3 / 2016	3		T4 / 2016		T1 / 2017		
Î		02	03	04	05	06	07	08	09	10	11	12	01	02	03
67	▼ WP3		WP3	/											
68	Calcolo ottica nuove linee	Calo	olo ottica nuove linee)-	BTF 2 BTF 3									
69	Ottimizzazione layout	1		(Ottimizzazione layout	· D1	BTF 1; LINAC 1;	Vuoto 1; RF							
70	Layout definitivo				Layout	definition 😽	BTF 1								
71	Specifiche dipoli				1	specifict <mark>e</mark> dipoli 🦲		BTF 2; Magneti 2	2; BTF 1; Ma						
72	Specifiche quadrupoli	1			Speci	iche qu <mark>id</mark> rupoli 🦲	;	Magneti 1; Magn	wti 2; BTF 1						
73	Specifiche alimentatori magneti	2				Specifiche aliment	atori magn		Magneti 1; Magneti 2	LINAC					
74	Specifiche camera sottile pulsato	1				Specifiche camera	sottle pul 🛶	(Disegnatore 1; Vuoto	1; LINA					
75	Disegno beam-pipe	1			Dise	gno bei m-pipe 📒			Disegnatore 2; Vuoto	2					
76	Disegno supporti	1			0	isegno apporti 🦲			Disegnatore 1; LINAC	6					
77	Progettazione edilizia				Progr	ttazione edilizia 🦲						- Edilizia 1; Dis	egnatore 1		
78	Specifiche alimentatori	2				Specific	che alimentatori	i de la constante de la consta	Magneti 2; LINAC 1						
79	Gara dipoli						Gara dipoli	¢							
80	Gara quadrupoli						Gara quadrupoli	Ċ							
81	Acquisto alimentatori						Acq	uisto alimentatori (
82	Costruzione supporti						Cos	truzione supporti		Disegna	itore 1				
83	Costruzione beam-pipe						Costru	zione beam-pipe		Dise	gnatore 2				
84	Costruzione camera sottile						Costruzio	ne camera sottile (- Disegnatore			
85	Test vuoto beam-pipe	1							Test vuoto	beam-pipe	- Vuoto 1; V	uoto 2			
86	Test e misura magneti	1													
87	Smontaggio linea BTF														
88	Edilizia BTF	1													
89	Installazione nuove linee (lato BTF)														
90	Installazione nuova linea (lato linac)														
91	Commissioning nuove linee	1											1		
92	Installazione PADME	1													
93	Project management		Project management								2016		-	201	,
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					to	oday									



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Revised plan (new beam-lines)

*	Title		T2 / 2017			T3 / 2017	CENTRALIVER REFEREN		T4/2017	anana kaona	T1 / 2018		
1		04	05	06	07	08	09	10	11	12	01	02	03
67	▼ WP3												
68	Calcolo ottica nuove linee												
69	Ottimizzazione layout	1											
70	Layout definitivo												
71	Specifiche dipoli												
72	Specifiche quadrupoli	1											
73	Specifiche alimentatori magneti	2											
74	Specifiche camera sottile pulsato	1											
75	Disegno beam-pipe	1											
76	Disegno supporti	1											
77	Progettazione edilizia					_					-		
78	Specifiche alimentatori	2											
79	Gara dipoli				BTF 1								
80	Gara quadrupoli	BTF 1											
81	Acquisto alimentatori		LINAC 1										
82	Costruzione supporti												
83	Costruzione beam-pipe												
84	Costruzione camera sottile										-		
85	Test vuoto beam-pipe	1											
86	Test e misura magneti	1	Test e n	nisura magneti 🖵	<u> </u>	Magneti 1; Magneti 2;	Magn				-		
87	Smontaggio linea BTF											Smon	taggio linea BTF
88	Edilizia BTF	1											Edilizia BTF
89	Installazione nuove linee (lato BTF)												Installazione nue
90	Installazione nuova linea (lato linac)			Installazione	nuova linea (lat			LINAC 4; BTF 2; Vuot	o 2; U		-		
91	Commissioning nuove linee	1											
92	Installazione PADME	1											Install
93	Project management												
BTF BTF June 14th, 2016 DESY - 1st AIDA-2020 Annual Meeting AIDA													



Revised plan (new beam-lines)

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1		01	02	03	04	05	06	07	08	09	10	11	12	
00	 Commissioning Linesc 					CONTRACTOR	IIY DIWN - C	1	UNITA I, LINNA E, LIN	No Yest				
66	Ottimizzazione LINAC			Ottimizzazione LINAC			LINAC	3; LINAC 4; LINAC 5;						
67	▼ WP3								~					
68	Calcolo ottica nuove linee													
69	Ottimizzazione layout													
70	Layout definitivo													
71	Specifiche dipoli													
72	Specifiche quadrupoli													
73	Specifiche alimentatori magneti													
74	Specifiche camera sottile pulsato													
75	Disegno beam-pipe													
76	Disegno supporti													
77	Progettazione edilizia													
78	Specifiche alimentatori													
79	Gara dipoli													
80	Gara quadrupoli													
81	Acquisto alimentatori													
82	Costruzione supporti													
83	Costruzione beam-pipe													
84	Costruzione camera sottile													
85	Test vuoto beam-pipe													
86	Test e misura magneti													
87	Smontaggio linea BTF		Smon	taggio linea BTF		UNAC 5; LINAC 6;	LINAC 3;							
88	Edilizia BTF			Edilizia BTF 🖣	Edilizi	a 1								
89	Installazione nuove linee (lato BTF)			Installazione nue	we linee (lat	-C	- LI	AC 6; LINAC 3; LIN	IAC 4;					
90	Installazione nuova linea (lato linac)													
91	Commissioning nuove linee						Commissioning	nuove linee	BTF 1;	LINAC 1; BTF 2				
92	Installazione PADME			Instalk	zione PADME	40	PA	DME						
93	Project management													

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