Preventivi e Anagrafica 2023
Roma Tor Vergata
14/7/2022

B.Liberti come Coordinatrice Locale CSN1

Esperimenti e Sigle a Tor Vergata

- **ATLAS → P. Camarri**
- **FASE2_ATLAS → P.Camarri**
- **GMINUS2 → G. Di Sciascio**
- **LHCb → E. Santovetti**
- **NA62 → R. Ammendola**

Muon g-2
2023

Muon g-2 in breve

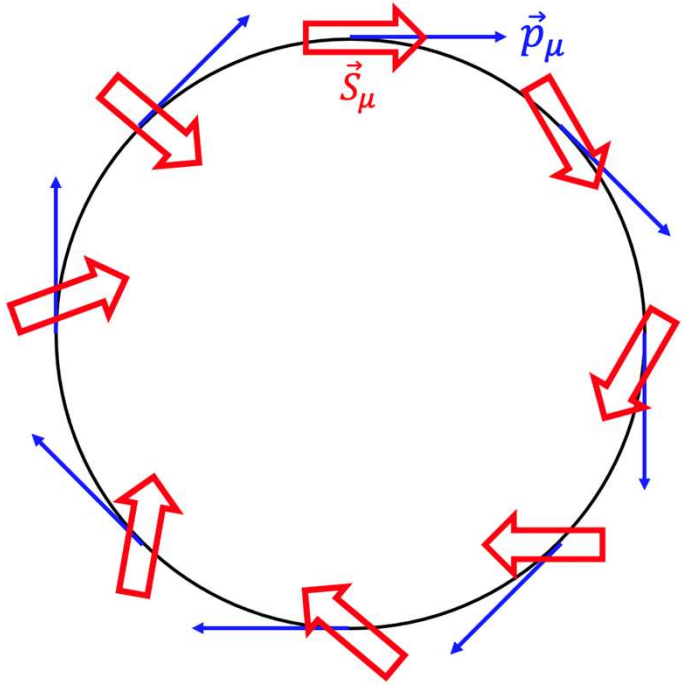
L'esperimento si basa sulla misura della frequenza di precessione anomala dello spin del muone in un campo magnetico. Per particelle relativistiche:

$$\vec{\omega}_a = \vec{\omega}_s - \vec{\omega}_c$$
$$= -\frac{e}{mc}\left[a_\mu \vec{B} - \left(a_\mu - \frac{1}{\gamma^2 - 1}\right)\vec{\beta} \times \vec{E} - a_\mu \left(\frac{\gamma}{\gamma + 1}\right)\left(\vec{\beta} \cdot \vec{B}\right)\vec{\beta}\right]$$

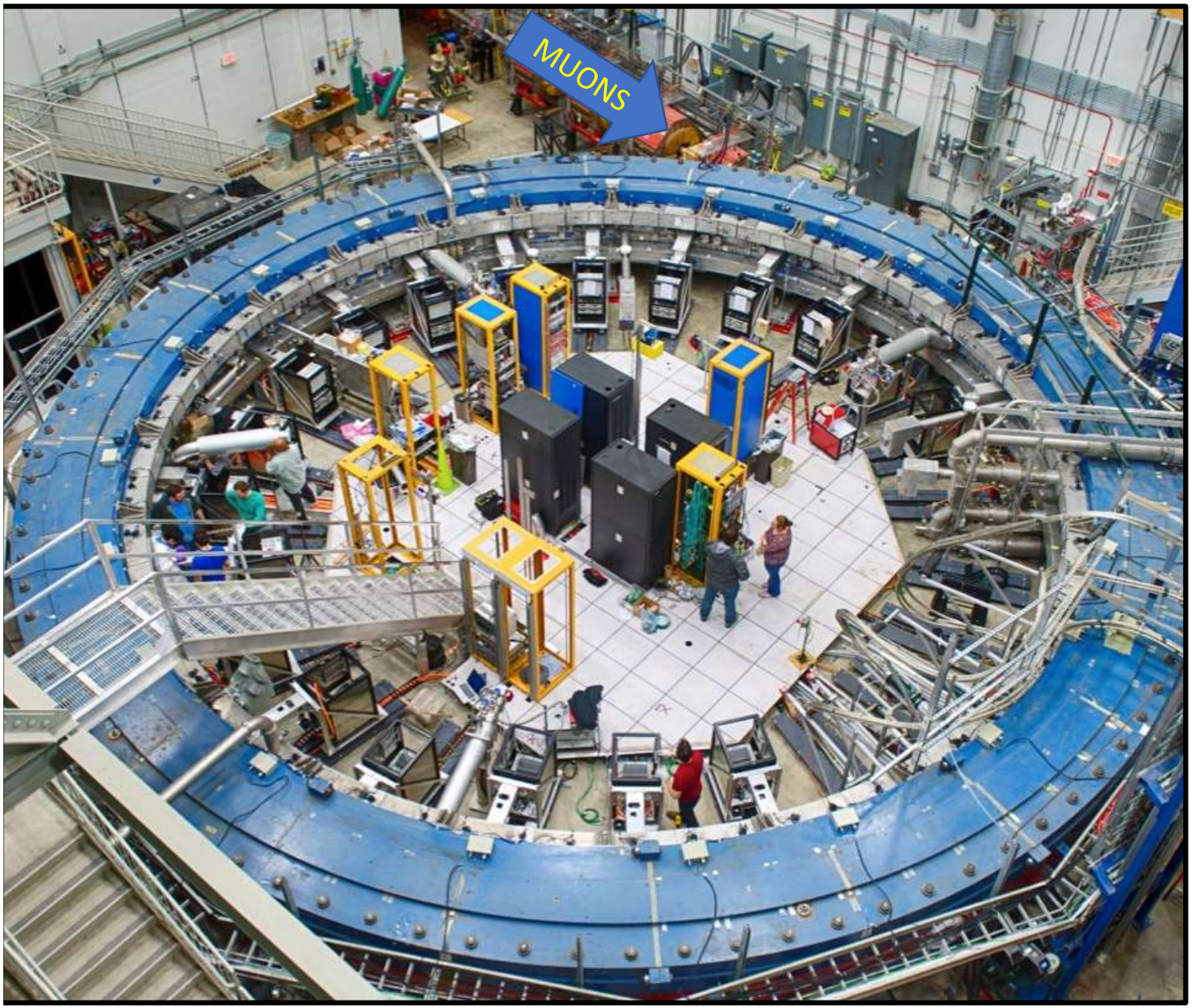
Il termine di campo elettrico $\vec{\beta} \times \vec{E}$ è causato dai quadrupoli eletrostatici usati per il focussing del fascio; per $\gamma = 29.3$ (CERN III) il termine si annulla. Usando un campo magnetico perpendicolare al fascio $\vec{\beta} \cdot \vec{B} = 0$, e l'espressione diventa*:

$$\vec{\omega}_a = -\frac{e}{mc} a_\mu \vec{B} \rightarrow \mathrm{a}_\mu = \frac{g_e}{2}\frac{m_\mu}{m_e}\frac{\mu_p}{\mu_e}\frac{\omega_a}{\omega_p}$$

Bisogna misurare precisamente ω_a e il campo magnetico (ω_p).

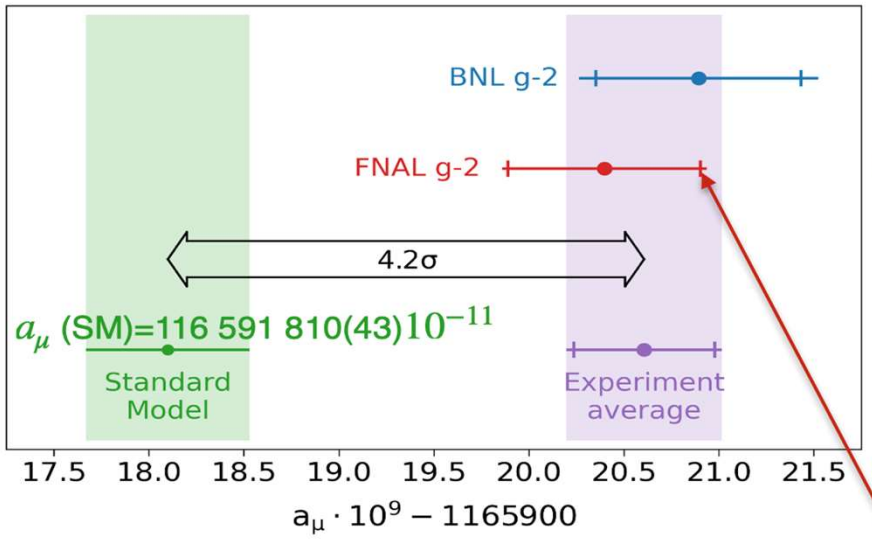


* Questi termini verranno aggiunti come correzioni al valore finale con le loro sistematiche



- Anello di accumulazione da 1.45 T
- 24 calorimetri (1296 cristalli di PbF2)
- 2 tracciatori
- 4 quadrupoli per il focussing verticale
- 3 kickers per il posizionamento del fascio
- 378 sonde NMR per la misura del campo magnetico
- Sistema laser per la misura del guadagno dei SiPM

Experimental results: Run 1



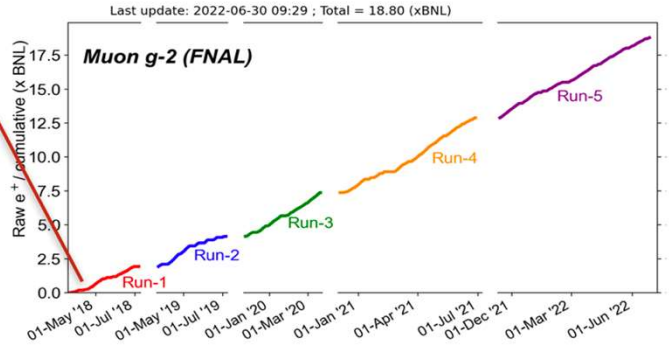
a_μ (BNL)=116 592 089(63)×10^{-11} (540 ppb)

a_μ (FNAL)=116 592 040(54)×10^{-11} (460 ppb)

a_μ (Exp-SM)=251(59)×10^{-11} -> 4.2σ

a_μ (Exp)=116 592 061(41) x10^{-11}(350 ppb)

- ✓FNAL determined anomaly with 460 ppb precision
- ✓Nothing was found that indicated contradiction with BNL results
- ✓15% smaller error
- ✓Good agreement



Big splash at the Media


Beam dynamics corrections to the Run-1 measurement of the muon anomalous magnetic moment at Fermilab

Magnetic Field Measurement and Analysis for the Muon g−2 Experiment at Fermilab

Measurement of the anomalous precession frequency of the muon in the Fermilab Muon g − 2 experiment

Measurement of the Positive Muon Anomalous Magnetic Moment to 0.46 ppm

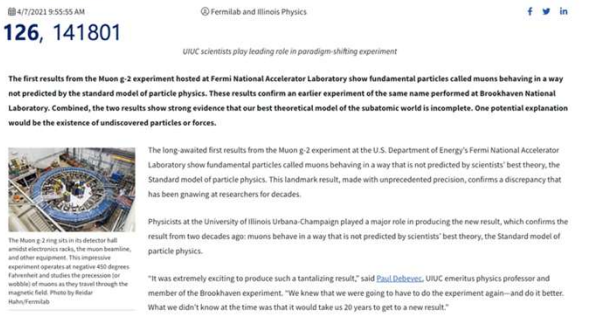
Beam dynamics corrections: PRAB (TBD) arXiv:2104.03240

$\tilde{\omega}_p$ analysis: Phys. Rev. A **103**, 042208

ω_a analysis: Phys. Rev. D **103**, 072002

Phys. Rev. Lett. **126**, 141801


First results from Fermilab's Muon g−2 experiment strengthen evidence of new physics


4/7/2021 9:55:55 AM

Fermilab and Illinois Physics

UIUC scientists play leading role in paradigm-shifting experiment

The first results from the Muon g-2 experiment hosted at Fermi National Accelerator Laboratory show fundamental particles called muons behaving in a way not predicted by the standard model of particle physics. These results confirm an earlier experiment of the same name performed at Brookhaven National Laboratory. Combined, the two results show strong evidence that our best theoretical model of the subatomic world is incomplete. One potential explanation would be the existence of undiscovered particles or forces.

The Muon g-2 ring sits in its detector hall amidst electronics racks, the muon beamline, and other equipment. This impressive experiment operates at negative 450 degrees Fahrenheit and studies the precession (or wobble) of muons as they travel through the magnetic field. Photo by Reidar Hahn/Fermilab

The long-awaited first results from the Muon g-2 experiment at the U.S. Department of Energy's Fermi National Accelerator Laboratory show fundamental particles called muons behaving in a way that is not predicted by scientists' best theory, the Standard model of particle physics. This landmark result, made with unprecedented precision, confirms a discrepancy that has been gnawing at researchers for decades.

Physicists at the University of Illinois Urbana-Champaign played a major role in producing the new result, which confirms the result from two decades ago: muons behave in a way that is not predicted by scientists' best theory, the Standard model of particle physics.

"It was extremely exciting to produce such a tantalizing result," said Paul Debevec, UIUC emeritus physics professor and member of the Brookhaven experiment. "We knew that we were going to have to do the experiment again—and do it better. What we didn't know at the time was that it would take us 20 years to get to a new result."


The New York Times

VOL. CLXX .... No. 59,022 NEW YORK, THURSDAY, APRIL 8, 2021 $3.00

Late Edition

Biden Tax Plan Aims to Curtail

Contagious Variant Is Fueling Surge in Infections Across the U.S.

PAIR OF SETBACKS

A Particle's Tiny Wobble Could Upend the Known Laws of Physics

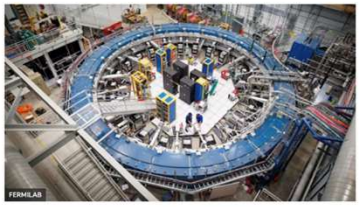
A ring at the Fermi National Accelerator Laboratory in Illinois is used to study the wobble of muons.

Adventurers Fleeing Pandemic Strain the West's Rescue Teams

A trail in the Wind River Range in western Wyoming.

Fizikçilere göre, doğadaki 5. temel kuvvete ilişkin 'güçlü kanıtlar ortaya çıktı'

8 Nisan 2021



ABD'de bilim insanları, yapılan bir deneyde küçük bir atom altı parçacığın bilinen fizik yasalarına uymadığını açıkladı. Fizikçiler bu durumun doğadaki beşinci temel kuvvetin kanıtı olduğunu söylüyor.


Mark Hamill
@HamillHimself

Evidence is mounting that The Force has been with us...
ALWAYS.

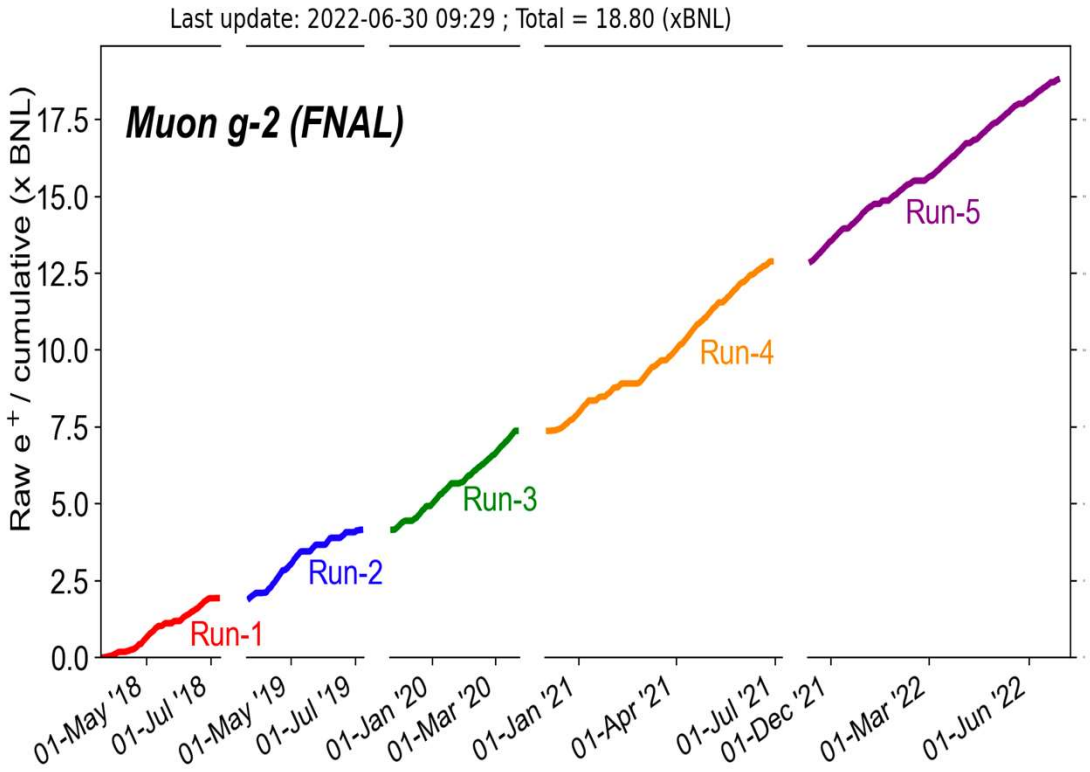
The New York Times @nytimes · 3h

Breaking News: Evidence is mounting that a tiny subatomic particle is being influenced by forms of matter and energy that are not yet known to science but which may nevertheless affect the nature and evolution of the univer...

1:37 PM · 4/7/21 · Twitter Web App

1,320 Retweets 71 Quote Tweets 8,695 Likes

Experiment status July 2022



- Run-2 and Run-3 analysis are ongoing -> reduce combined exp. error by 2 times
- Run-5 will end in July -> Run-4 and beyond will reduce the statistical uncertainties down to **100 ppb** in total.
- Run-6 will be the last year to collect data

Proposals for 2023

- We proposed a new run with mu- to investigate possible differences with previous runs
- The Fermilab director rejected this proposal
- We are discussing a possible Run 6 with mu+
- We cannot exclude that the Fermilab director will stop g-2 after Run5

Anagrafica 2023

Di Sciascio: 50%
Gioiosa: 50%
Miozzi: 70%
Piacentino: 0%
Sorbara: 70%

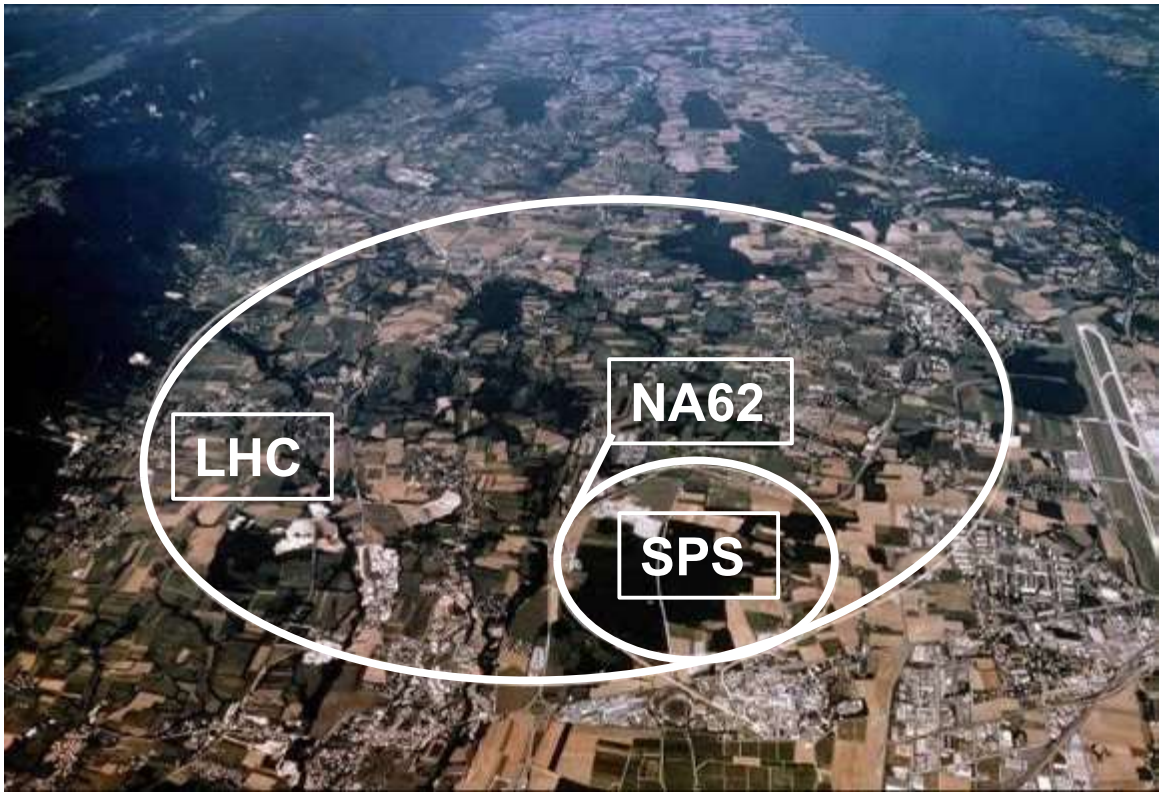
Totale: 2.40

Richieste:

Missioni: 40 keuro (in caso si faccia il Run 6)

The NA62 experiment at CERN SPS

•**NA62 Collaboration** (~ 200 participants): Birmingham, Bratislava, Bristol, Bucharest, CERN, Dubna (JINR), Fairfax, Ferrara, Florence, Frascati, Glasgow, Lancaster, Liverpool, Louvain-la-Neuve, Mainz, Merced, Moscow (INR), Naples, Perugia, Pisa, Prague, Protvino (IHEP) , Rome I, Rome II, San Luis Potosi, SLAC, Sofia, TRIUMF, Turin, Vancouver (UBC)



Goal: O(10%) precision measurement of BR(K → p nn)

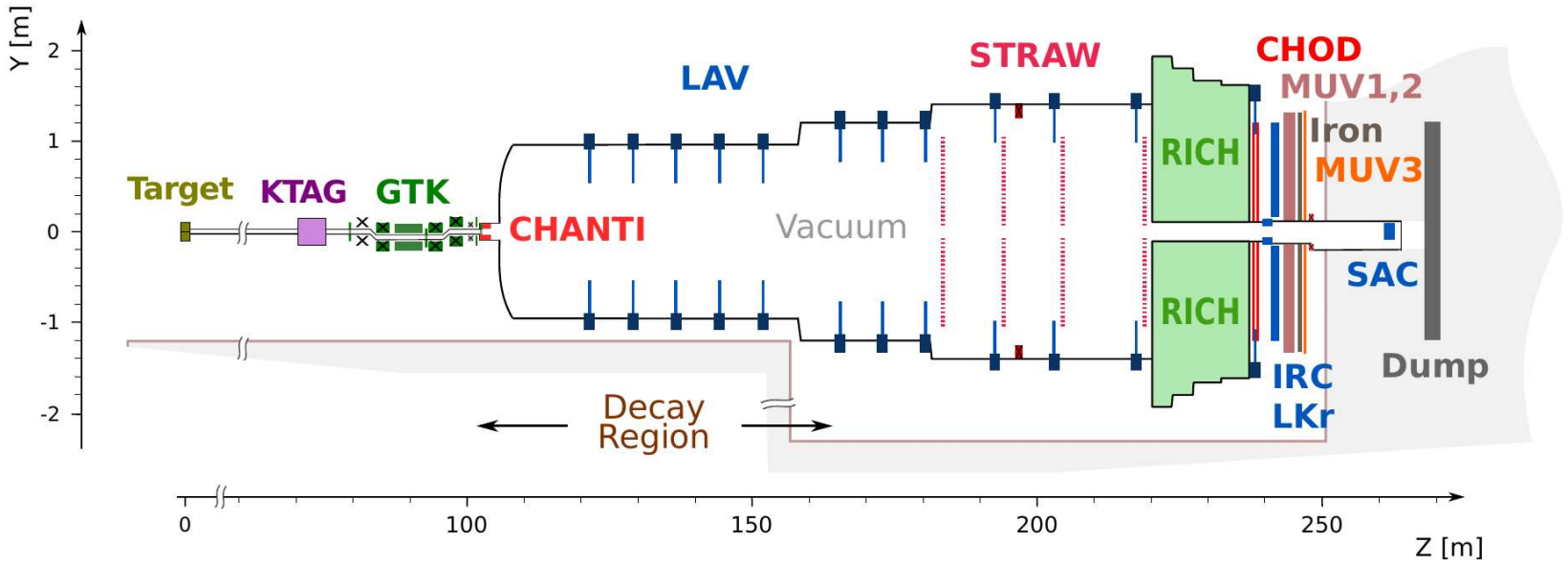
•Statistics: O(100) events

•K : decays 10

•Signal acceptance: O(10%)

•Background rejection: > 10

The NA62 beam



[NA62 Detector Paper, 2017 JINST 12 P05025]

SPS beam

- 400 GeV/c protons
- 2x10 protons/spill
- 3.5 s spill
- ~10 POT/year

Secondary beam

- 75 GeV/c momentum, 1% bite
- 100 μrad divergence (RMS)
- 60x30 mm transverse size
- K (6%)/π (70%)/p(24%)

Decay region

- 75 m fiducial region
- ~5 MHz K decay rate
- Vacuum ~10 mbar

The NA62 detector

KTAG

Nitrogen filled differential Cherenkov counter to tag beam kaons with 70 ps time resolution.

GTK Three hybrid silicon pixel detector stations (<0.5% X0) with 100 ps time resolution..

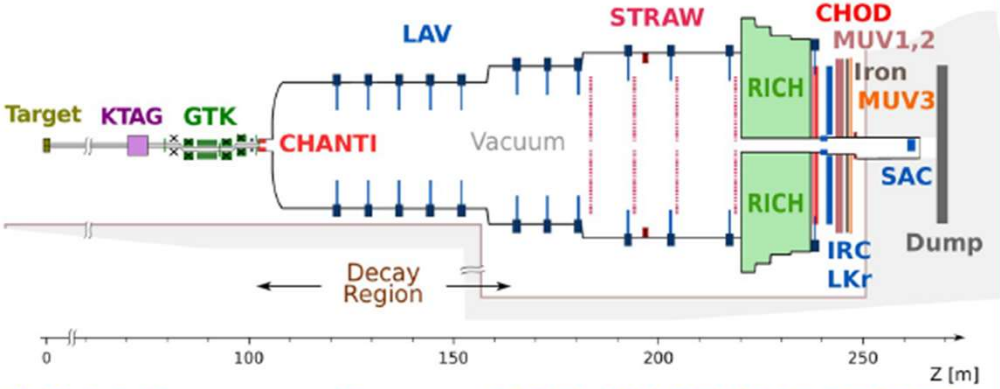
CHANTI

Guard ring polystirene-based scintillator bars to veto beam induced inalastic interactions and muon halo close to the beam.

LAV

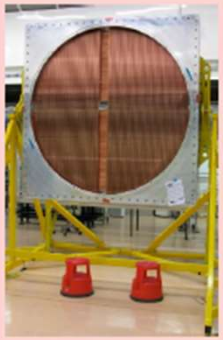
12 stations with 4/5 lead glass rings (from OPAL) in vacuum covering angular region 8.5-48 mrad.

MUV MUV1 (25 layers) and MUV2 (23 layers) iron-plastic scintillator calorimeters from NA48.
MUV3: after 80 cm iron, 5cm thick single layer scintillator tiles.



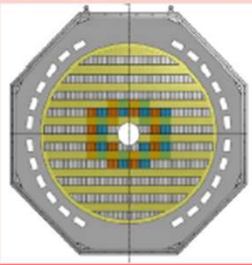
[NA62 Detector Paper, 2017 JINST 12 P05025]

STRAW



Precision low-mass straw spectrometer operating in vacuum (4 chambers, 4 views each) to measures trajectories and momenta of charged particles produced in kaon decays.

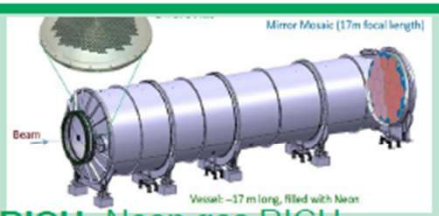
CHOD



Plastic scintillator charged particles odoscope for fast triggering.

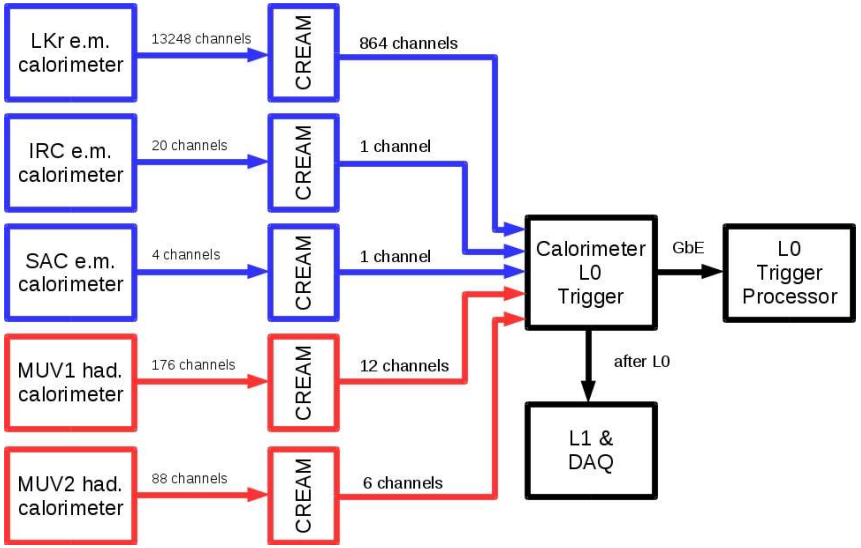
IRC/SAC Inner Ring Calorimeter and Small Angle Calorimeter (lead plastic scintillators) for angular region below 1 mrad.

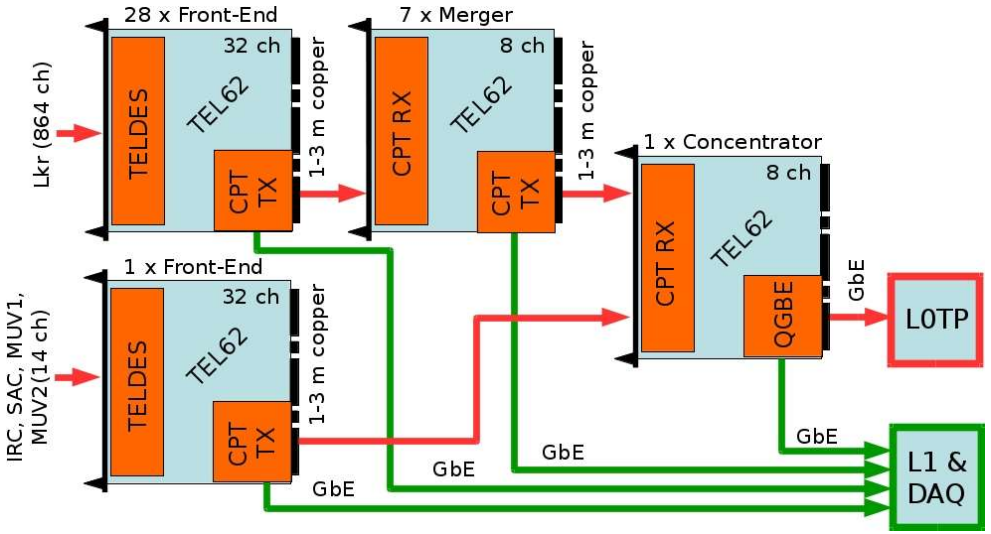
LKR 20 T liquid krypton calorimeter (from NA48) as forward photon veto in the angular region 1-8.5 mrad.

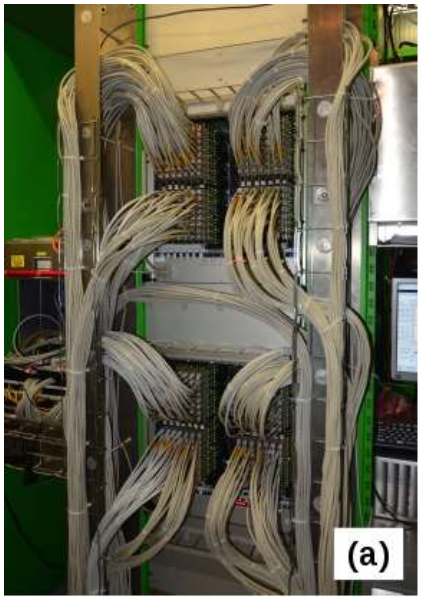


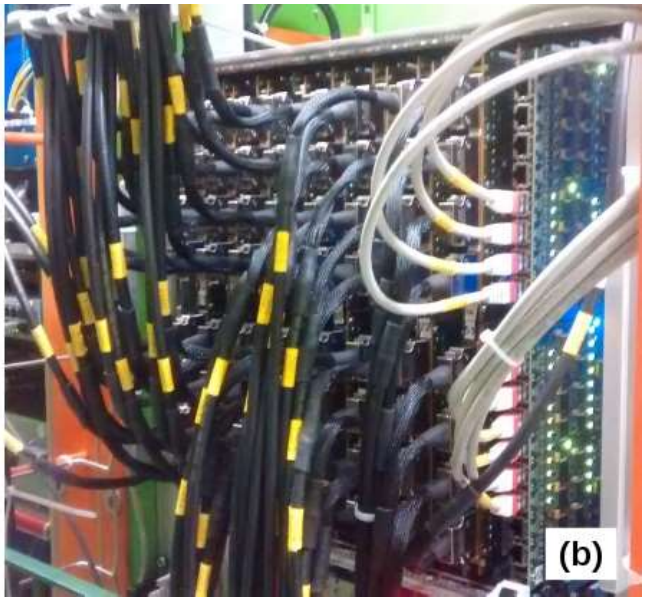
RICH Neon gas RICH counter with better than 100 ps time resolution for π/μ separation.

A Tor Vergata: L0Calo - trigger calorimetrico





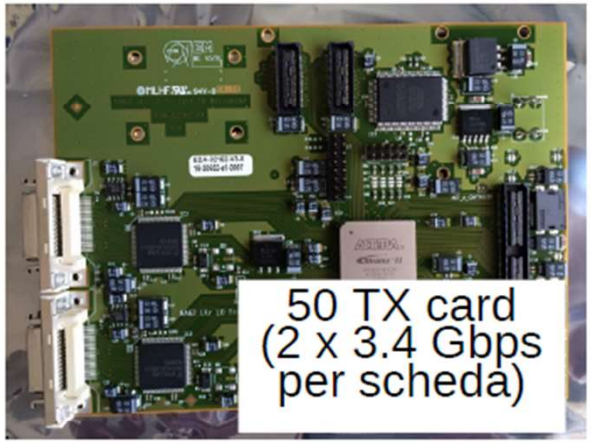




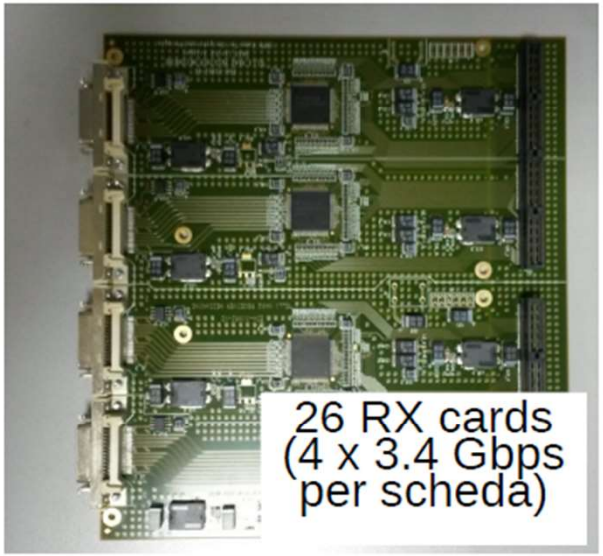
- Tutto l'hardware installato dall'inizio del run del 2015 (37 TEL62 e 111 mezzanini)
- Aggiunti gli ingressi dei calorimetri elettromagnetici IRC e SAC e dei calorimetri adronici MUV1 e MUV2
- Primitive di trigger su link GbE all'L0 Trigger Supervisor

A Tor Vergata: L0Calo - trigger calorimetrico

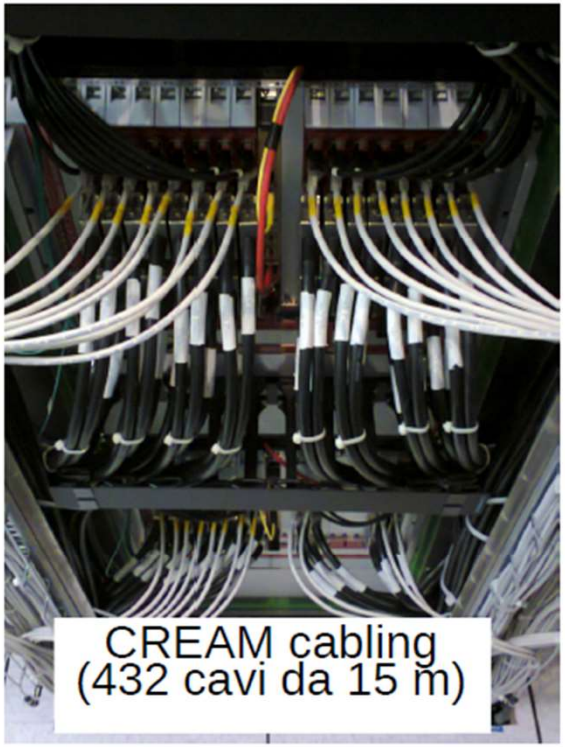
70 deserializer cards
(collaborazione con INFN Pg)



50 TX card
(2 x 3.4 Gbps
per scheda)



26 RX cards
(4 x 3.4 Gbps
per scheda)



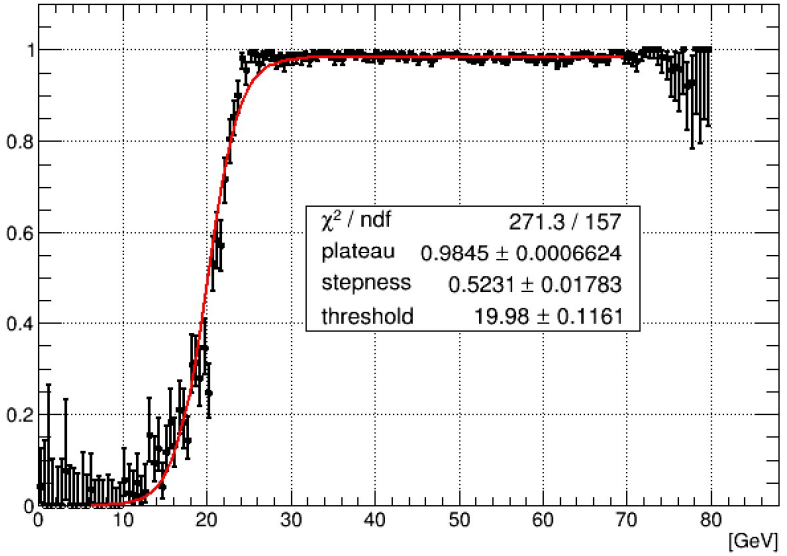
CREAM cabling
(432 cavi da 15 m)

Front-End cabling
(2 crate 9U, 964 pad)

TX-RX cabling
(1 crate 9U, 64 cavi,
3.4 Gbps per cavo)

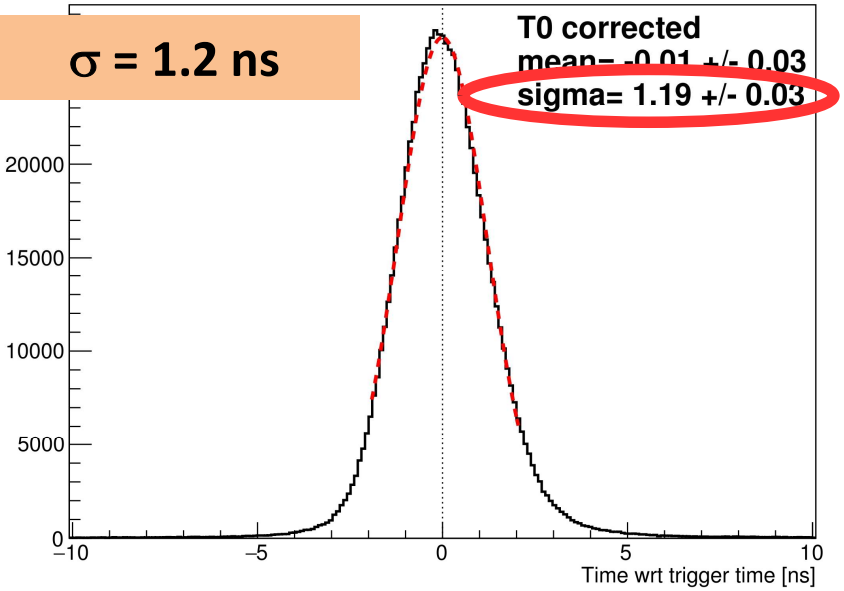
Calorimetric trigger performances

Soglia cluster 280 MeV

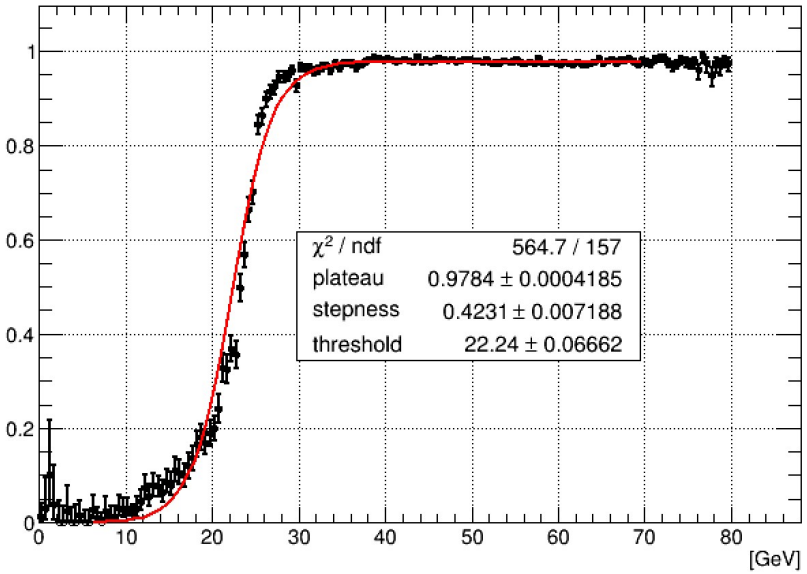


Time Offset for all supercells, good corrected

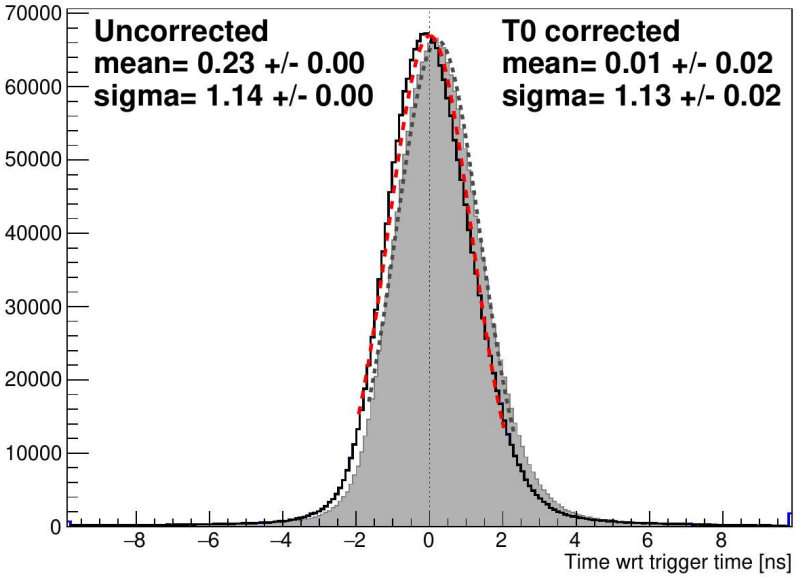
σ = 1.2 ns



Soglia cluster 560 MeV

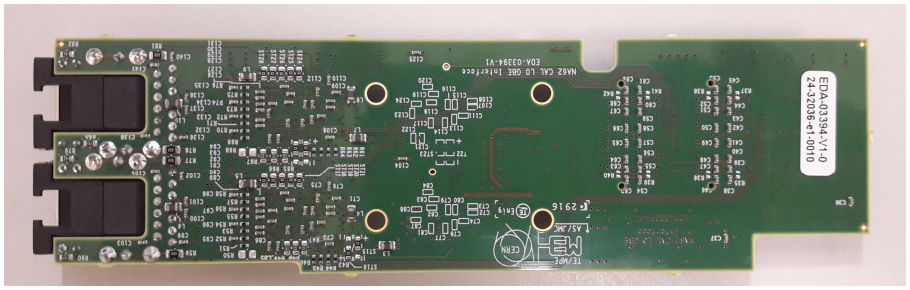


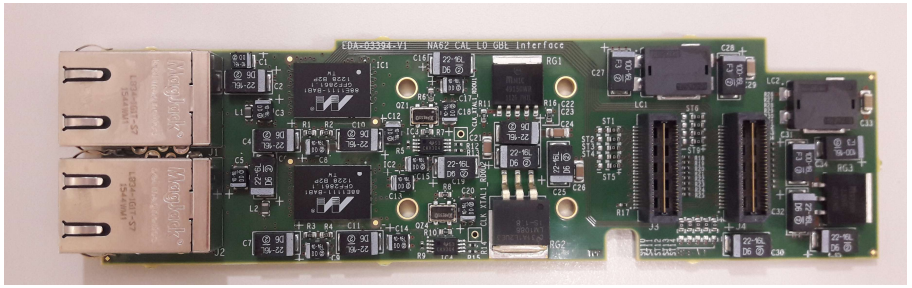
Time Offset for all supercells, corrected



L0Calo readout

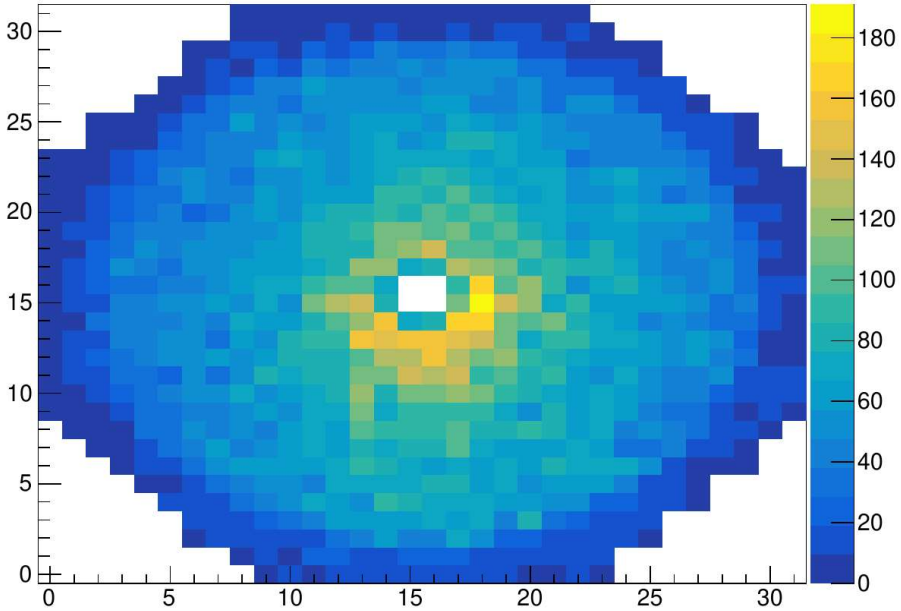
Nel 2021 installati i mezzanini, nel 2022 finito il commissioning del firmware per il readout del calorimetro ad L0

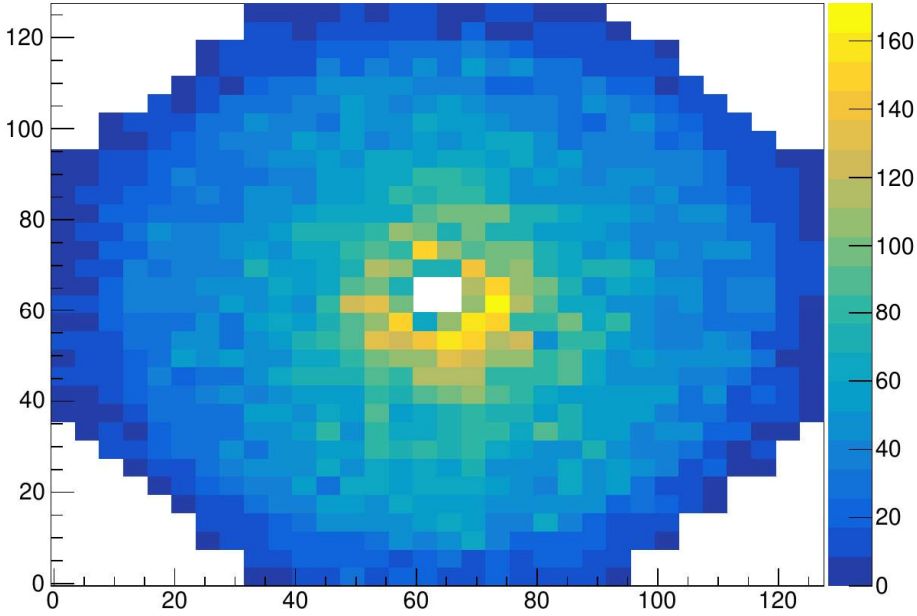




Adesso sarà possibile usare il calorimetro negli algoritmi software ad L1

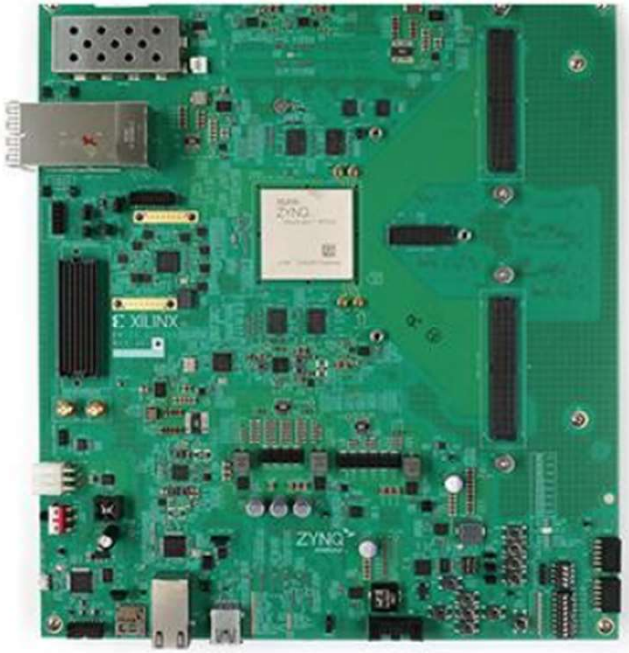
Primitive calcolate dal trigger e lette con il nuovo readout vs hit ricostruiti offline!

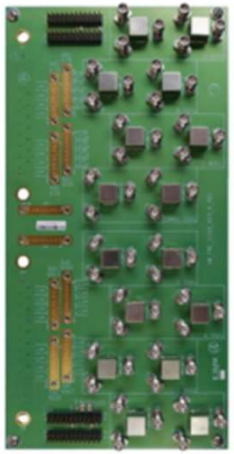




Attività 2023 Roma Tor Vergata

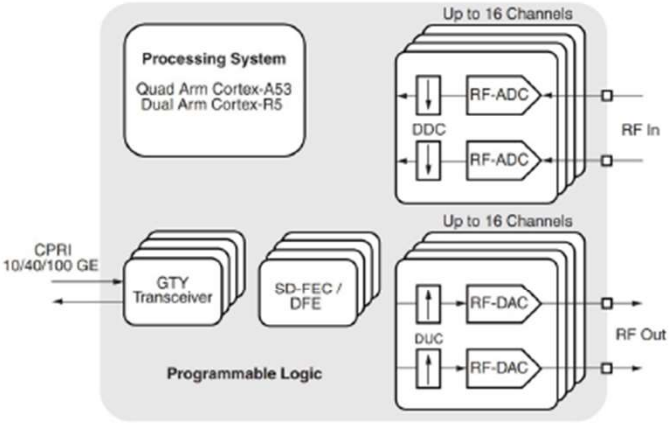
- attività di supporto e mantenimento di L0Calo
- finalizzazione del commissioning del Readout di L0Calo
- attività di R&D sul trigger calorimetrico per la prossima generazione di calorimetri in fase di sviluppo dal gruppo di LNF. In particolare si vuole effettuare uno studio di fattibilità riguardo l'uso dei dispositivi di classe "RFSoC" che integrano fino a 16 ADC a 14 bit a 2.5 GSPS su una singola FPGA con CPU ARM. Questa tecnologia permetterebbe l'implementazione di sistemi ad altissima banda e largamente paralleli per la digitalizzazione dei segnali analogici provenienti dai detector, il loro processamento di livello 0 e l'impacchettamento verso i livelli successivi, in uno schema di readout sia di tipo triggered sia triggerless.





XM655 Breakout Add-on Card

XM650 N79 Band Loopback Add-on Card



Richieste* economiche Roma Tor Vergata

MISSIONI	35
MI metabolismo (1 kE * 2 FTE)	2
ME riunioni di collaborazione al CERN (1 mu * 2 FTE)	8
ME run 30 settimane turni presa dati	17
ME esperto on call L0Calo, preparazione run e manutenzione L0Calo	8

CONSUMO	12
Metabolismo (1.5 kE * 2 FTE)	3
Manutenzione L0Calo	4
Sviluppo PCB per interfaccia con calorimetro, cavi e piccola componentistica	5

LICENZE	1
Contributo licenze EUROPRACTICE	1

INVENTARIABILE	22
Contributo acquisto workstation di sviluppo	2
Scheda di sviluppo ZCU216 con accessori	20

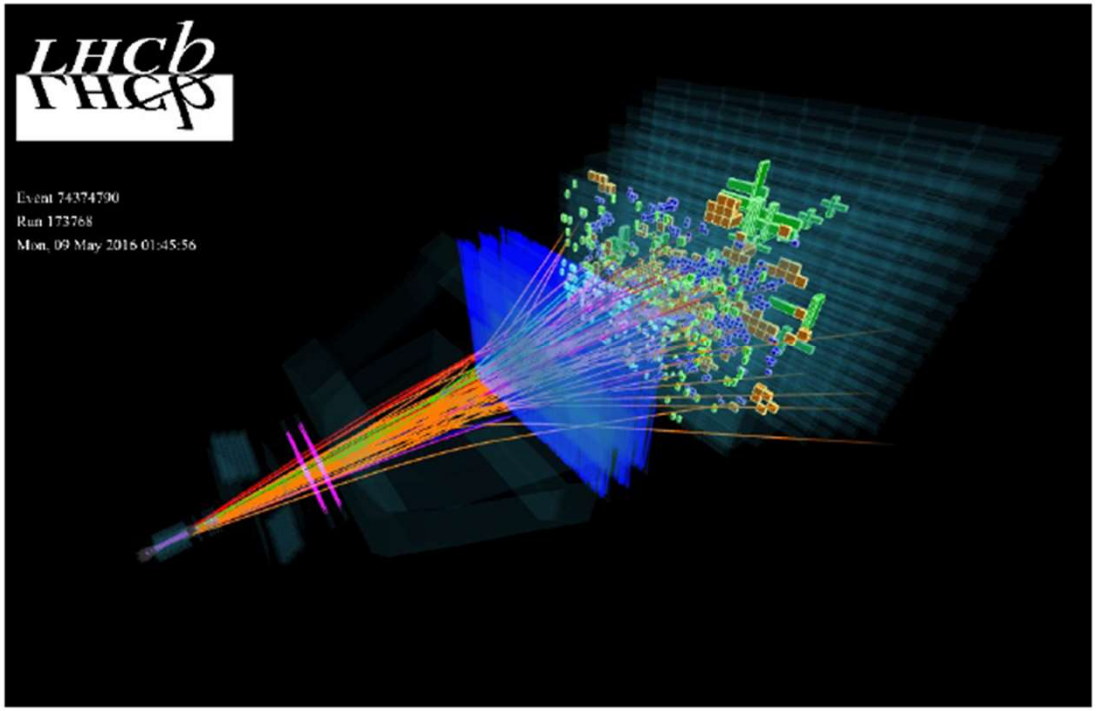
Ricercatori: 3 (1.6 FTE) - **Tecnologi:** 1 (0.4 FTE) - **Tecnici:** 1

Scarica la tabella in formato CSV

Cognome	Nome	%
Ammendola	Roberto	40%
Bonaiuto	Vincenzo	70%
Paoluzzi	Giovanni	30%
Salamon	Andrea	10%
Sargeni	Fausto	80%

*provvisorie

Esperimento LHCb al CERN



Scopo dell'esperimento è la verifica del modello standard delle interazioni fondamentali e l'eventuale **scoperta di nuova fisica** al di fuori di questo, attraverso misure di decadimenti più o meno rari (con o senza violazione di CP) di adroni con beauty

624 articoli e 48681 citazioni

l'attività del gruppo di Tor Vergata

Il nostro gruppo è impegnato nel progetto di **upgrade** dell'esperimento (Run3, 2023 → 2026, luminosità x5) partecipando alla realizzazione del nuovo sistema di **acquisizione dati** per il rivelatore di muoni.

Prende parte alla **presa dati** ed alla ordinaria manutenzione del rivelatore di muoni, di cui ha partecipato alla costruzione.

Partecipa all'**analisi dei dati**, portando avanti diverse misure di massa e Branching fractions di mesoni e bariaoni con beauty

Il gruppo

Alessia Satta	Ric INFN	100%
Emanuele Santovetti*	PA	100%
Giovanni Paoluzzi	Tecnico	50%

2 FTE

Dal 1.9.2022 un nuovo ricercatore RTD-B si unirà al gruppo per potenziare l'attività di analisi dato

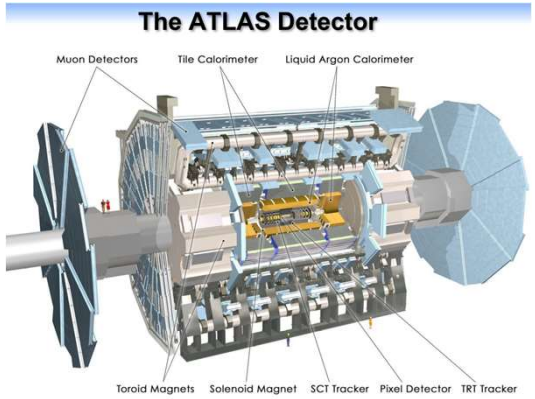
Le richieste per il 2023

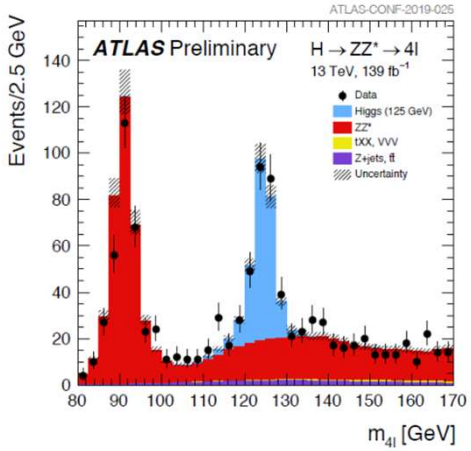
Missioni	17 KE
Consumo	3.0 KE

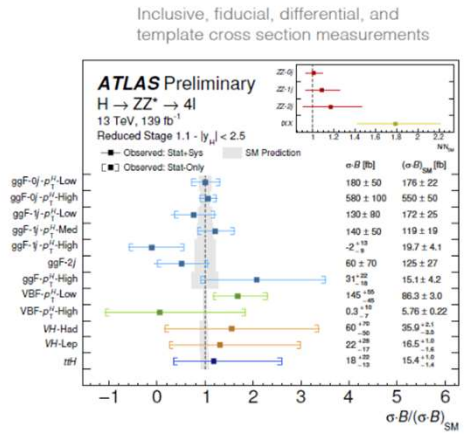
Le richieste di missioni sono per le riunioni di collaborazione e per l’installazione e test del nuovo sistema di acquisizione

ATLAS

- ATLAS Resp. Loc. P. Camarri







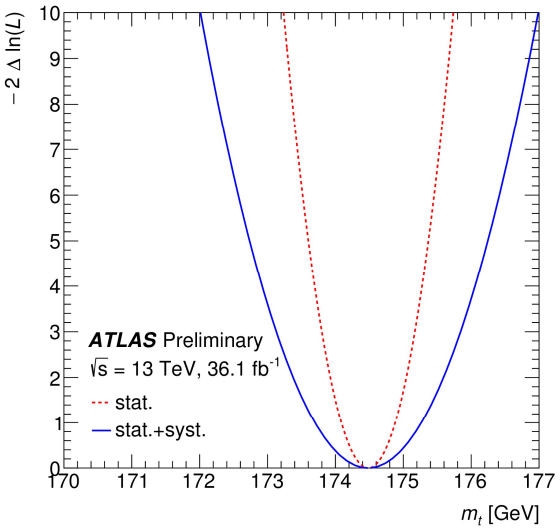
Overall σ(obs) / σ(SM) $= 1.04^{+0.09}_{-0.08}(\text{stat.})^{+0.04}_{-0.03}(\text{exp.})^{+0.06}_{-0.05}(\text{th.}) = 1.04^{+0.12}_{-0.10}$

- ATLAS- Physics
- ATLAS -RPC (muon trigger) maintance and DCS
- ATLAS-Upgrade FASE1 Progetto BIS78

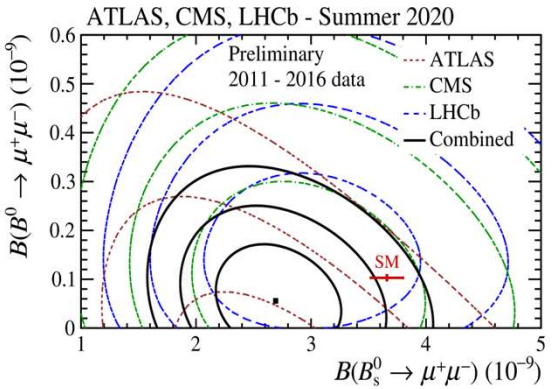
ATLAS- Physics

- **Top quark mass**
  - First 13 TeV result and most precise from ATLAS
  - Public note, paper (hopefully) soon
- **BR for $B^0_{(s)} \rightarrow \mu\mu$ and effective lifetime**
  - Sensitive to BSM physics, 2.1 sigma from SM; public note
- **W+ charm cross section**
  - Test of pQCD, measurement of strange PDF; analysis ongoing
- **Triple differential top production cross section**
  - Simultaneous meas. of mass, pdf, alpha_s; analysis ongoing
- **WbWb**
  - Understand better Wt/tt interference, analysis ongoing
- **Search for resonances in top pairs with dilepton events**
  - Search for BSM physics, analysis ongoing
- **Exclusive Flavour Changing Neutral Current decays $t \rightarrow Zc$**
  - Search for BSM physics, to be submitted soon

ATL-CONF-2019-046



ATL-CONF-2020-049



+publications in preparation on muon detector performance and calorimeter fast simulation!

ATLAS- Physics – Expertise and Roles

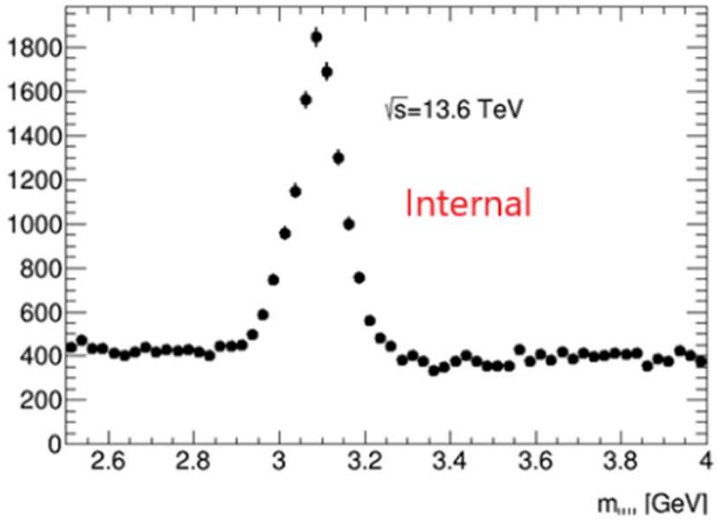
Expertise:

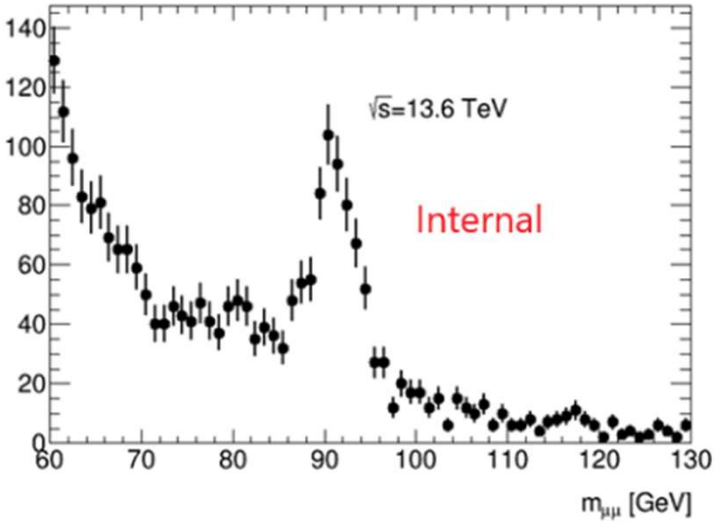
- **Physics** of Top quark, Higgs, W, Z, B, Exotics, PDFs
- **Signatures** single and multi-lepton, jets, MET, b, c final states at low and high boost
- **Detector simulation an performance:** muon detector performance, muon-in-jet tagging, detector fast simulation

Current Coordination Roles:

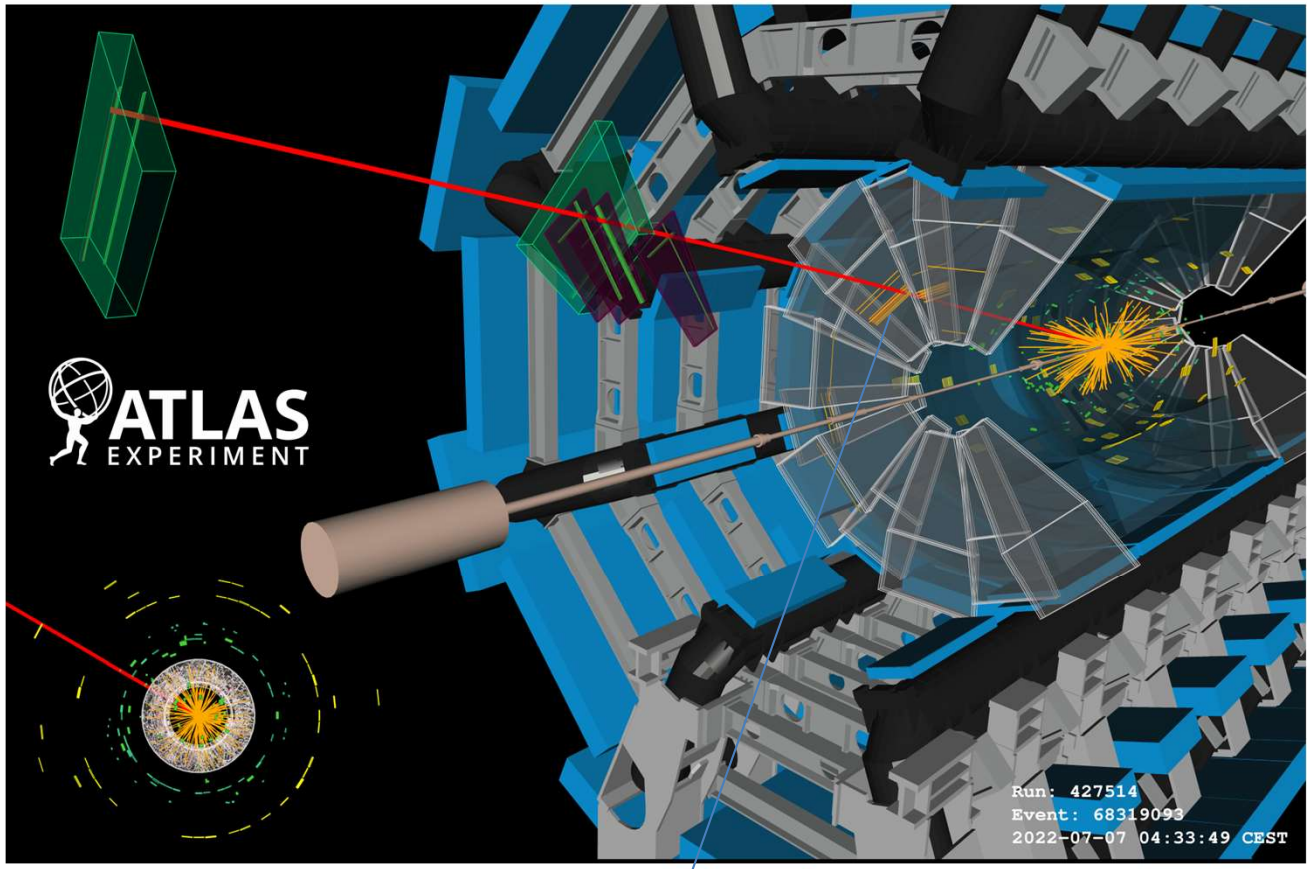
- ATLAS Muon Combined Performance: M.Vanadia
- ATLAS Simulation FastCaloSim Group Sub-convenor, Early Career Scientist Board: M. Faucci Giannelli
- LHC Heavy Flavour WG: U. De Sanctis

ATLAS- Physics Run 3





First run-3 data:
re-discovery of Jpsi and Z decays into muons!



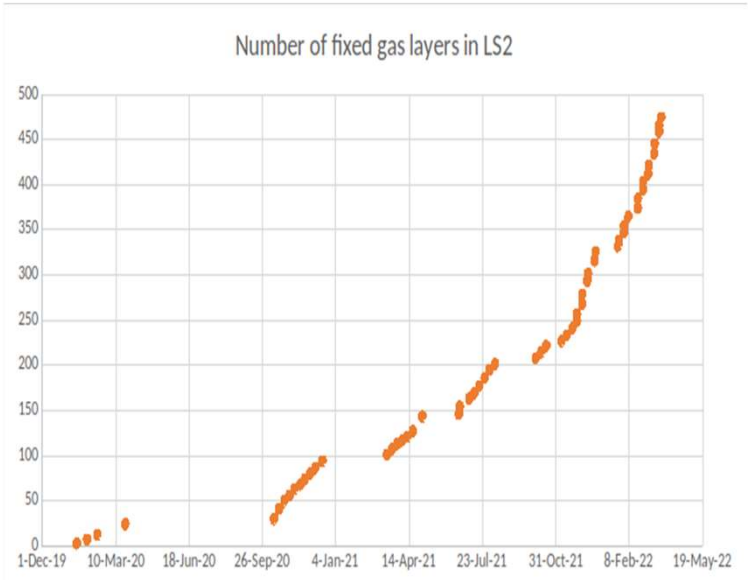
One of the first muons from 13.6 TeV collisions with hits in the NSW!

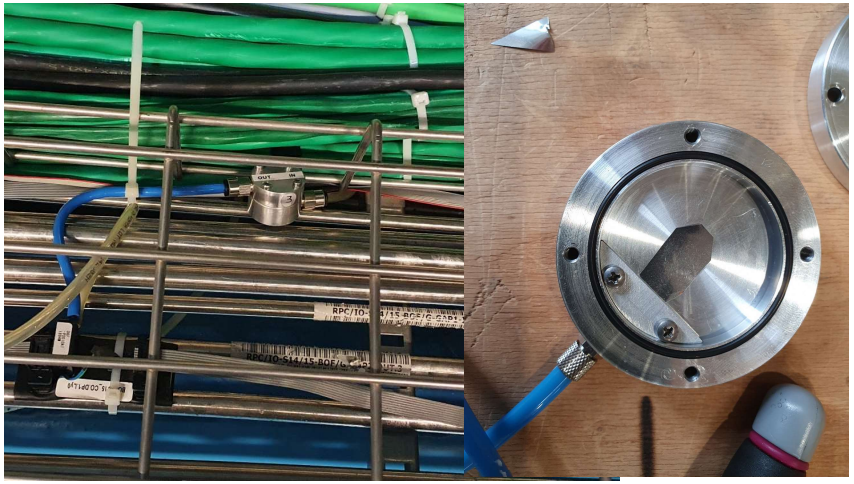
ATLAS -RPC (muon trigger) maintenance and DCS

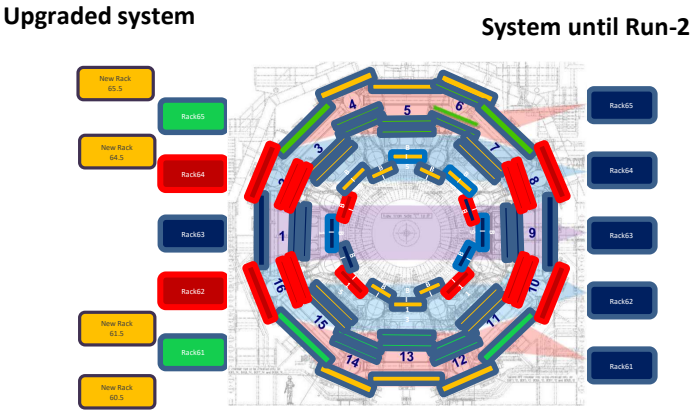
- **Lavoro di minimizzazione perdite di gas**

- Riparazione perdite di gas
- Nuovo sistema di distribuzione del gas
- Valvole di non ritorno sulle linee di uscita
- ! Nuovo Sistema di riparazione

Iniziato per test prima di Run-3

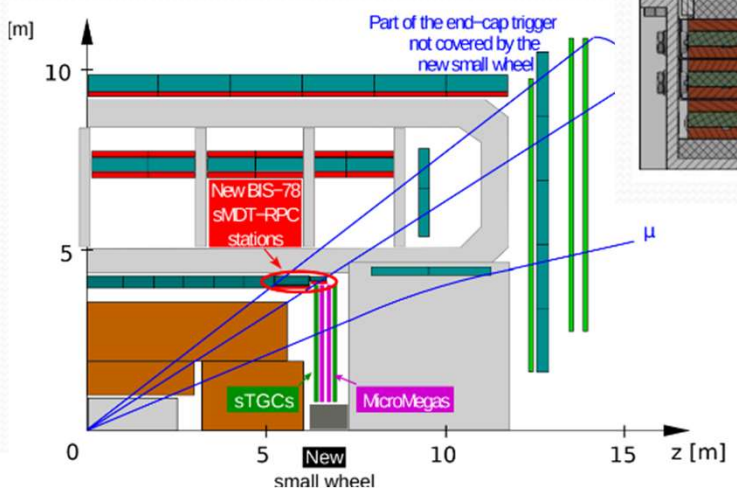


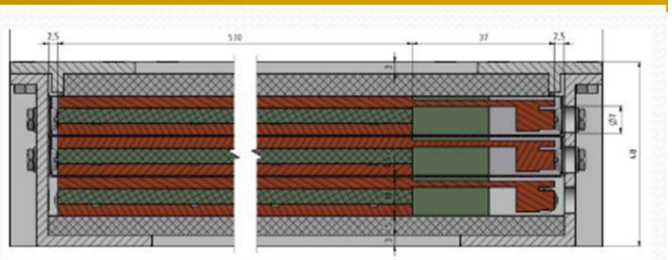




ATLAS-Upgrade FASE1 Progetto BIS78

- The existing 32 BIS7 and BIS8 MDT will be replaced by 16 new muon stations made of:
  - one sMDT BIS7+8 chamber
  - two RPC triplets (BIS7 and BIS8)
- Selectivity in transition region improved by adding a new trigger layer
- 8 stations for one end cap (side A) to be installed in 2020
- BIS78 can be considered as a pilot project for the Phase II BI upgrade.





New RPCs:
1 mm x 0.5 ns and up to 7 kHz/cm^2

New Gas Gap

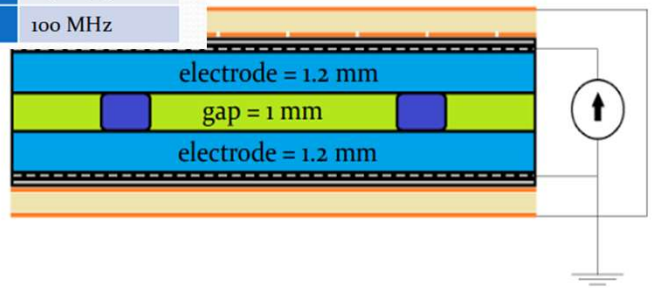
- Thinner gas gap (2 mm → 1 mm)
- Thinner electrodes (1.8 mm → 1.2 mm)
  - Lower detector weight
  - Thinner supports allowed
  - More efficient signal collection
  - Almost halve the applied HV
  - Improved charge distribution
  - Double time resolution

New Front End Electronics

- New amplifier and discriminator
  - Higher rate capability
  - Radiation hardness
  - Better space-time resolution
  - Inexpensive high performance low power FE

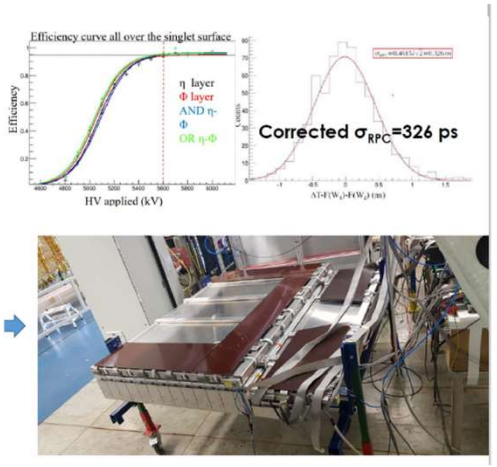
Amplifier in Silicon	
Gain	0.2-0.4 mV/fC
Power Consumption	3-5 V 1–2 mA
Band width	100 MHz

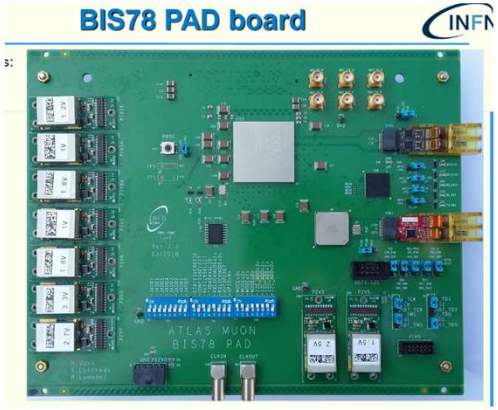
Discriminator in SiGe	
Threshold	0.5 mV
Power Consumption	2-3 V 4–5 mA
Band width	100 MHz

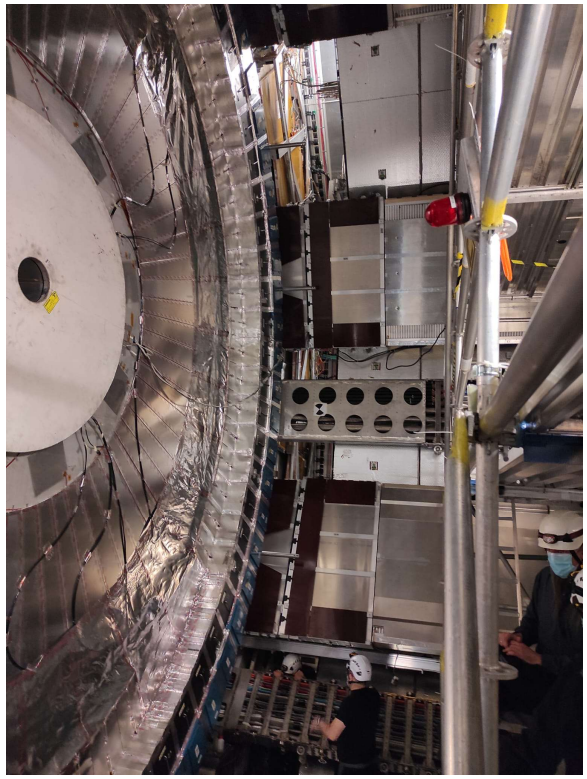


ATLAS-Upgrade FASE1 Progetto BIS78

- Progettazione e test chip e schede FE
- Test Gas gap alla produzione, a Gif++
- Armatura e test pannelli di lettura
- Produzione a BB5
- Elettronica di DAQ PAD-Board
- Certificazione Test CR BIS78

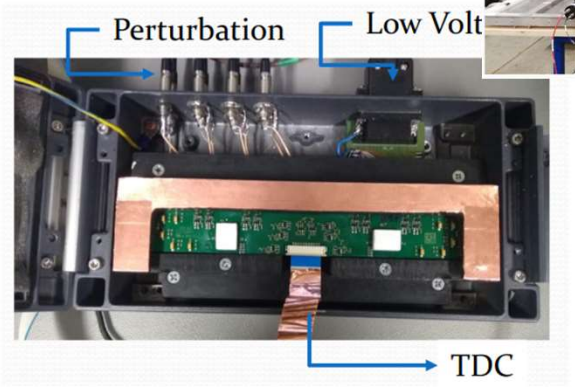






Installazione in caverna

Commissioning (HV, LV, DAQ)

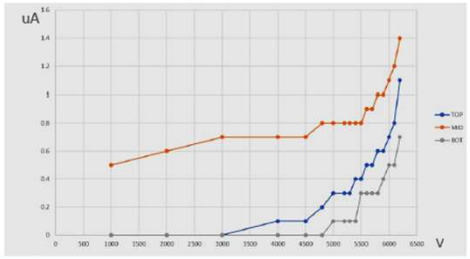


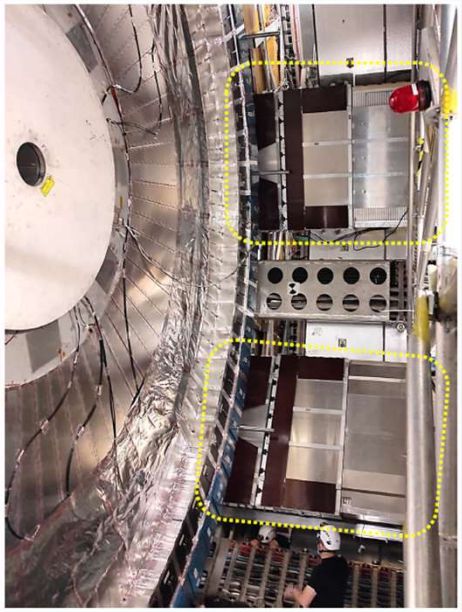
Installed and Commissioning Progetto BIS78

Detector status from pre-commissioning (i)

- All BIS78 Side A chambers installed since March 2021 and fully connected to services
- All BIS78 LV, HVs and gas connections commissioned
- RPC DCS allows for monitoring of BIS78 HV gap currents and LV FE currents on detector
- i/V curves were performed and all the chambers had passed this test

An example BIS78A10 i/V





Detector status from pre-commissioning (ii)

- LV commissioning in the final stage: entire system checked, few problematic cases had been found:
  - Sectors fully tested and operational from beginning: 6,10,12,14
    - finalizing the commissioning
  - Sectors commissioned with 1 problematic readout panel: 2,4
    - Wrong LV readback due to one Front End (out of 6)
    - Problem can be overcome by retuning FE voltages
  - Problematic sectors: 8,16
    - Problem on rackside LV driver board understood and fixed

➔ All sectors can be operated with no disconnections

- Cosmic ray certification ongoing:
  - Sectors 6-10-12-14 → half of the commissioning tests performed; work is going on in parallel with the expected end in the following weeks
  - Sectors 4-8-16 → preliminary CR tests passed, ready for the second part of commissioning
  - Sector 2 → Noise/corrupted DAQ data found, being investigated but likely solvable.

➔ All chambers expected to be working and able to provide trigger

ATLAS Anagrafica e Richieste 2023

cognome	nome	perc
Aielli	Giulio	10%
Calconi	Laura	50%
Camarri	Paolo	10%
Cardarelli	Roberto	10%
Cerrito	Lucio	90%
De Sanctis	Umberto	100%
Di Ciaccio	Anna	20%
Di Stante	Luigi	20%
Faucci Giannelli	Michele	*
Ferretti	Simone	50%
Liberti	Barbara	10%
Pastori	Enrico	80%
Pizzimento	Luca	10%
Proto	Giorgia	20%
Raffaeli	Fabiola	100%
Rocchi	Alessandro	10%
Santonico	Rinaldo	*
Travaglini	Marco	50%
Tusi	Enrico Maria	50%
Vanadia	Marco	80%

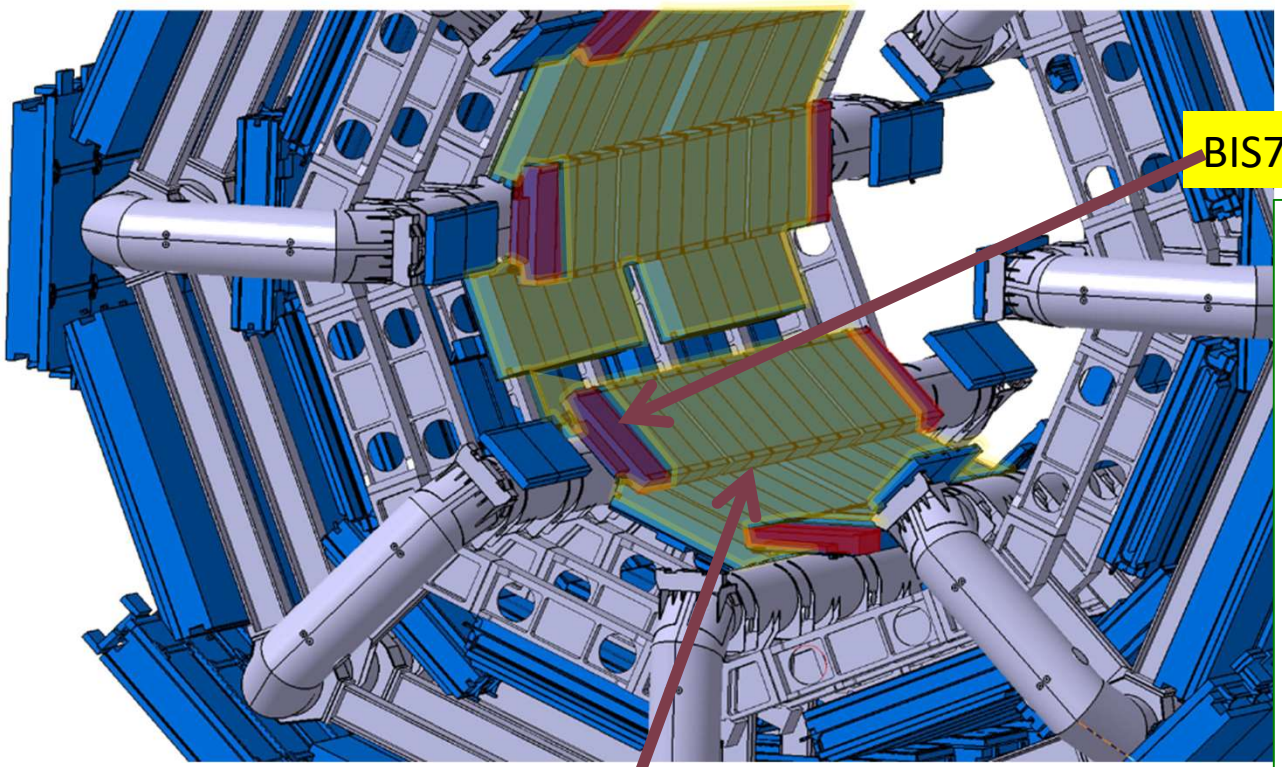
Missioni per

Responsabilità + Turni + Assemblaggio BI

Richiesto 406 kEuro

FASE2_ATLAS

- FASE2_ATLAS Resp. Loc. P. Camarri
- ATLAS-Upgrade-FASE2 Progetto BI
- → Nuovo layer RPCs nel Inner Barrel



BI project

To increase barrel trigger acceptance (73% → 96%), increase redundancy to safely operate the present chambers

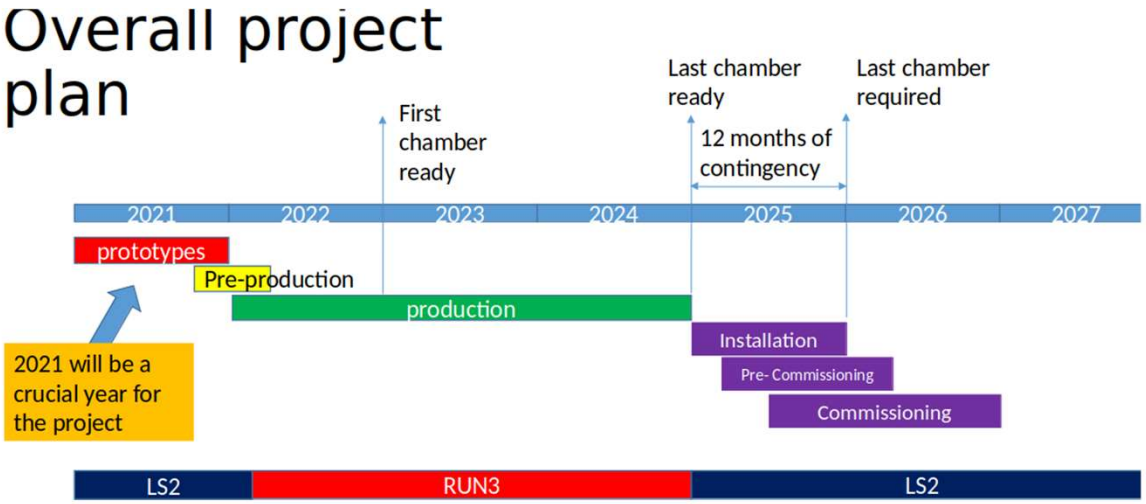
96 BIS 1820x916 mm^2

116 BIL(BIM,BIR) 2820x1096 mm^2

-
- Total surface **1800** m^2

FASE2_ATLAS Progetto BI

- Progetto Internazionale con forte responsabilità Italiana



Gruppi coinvolti: Bologna, Cosenza, Frascati, Napoli, Pavia, Roma I, Roma II

Progetto e attività a responsabilità italiana

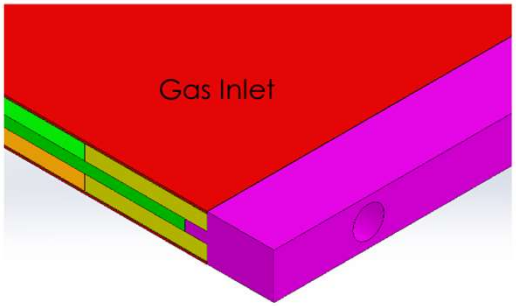
Deliverables	Quantity
Piani di bakelite	1728
Gas Gap	432
Read Out panel	864
Triplets	144
Front End boards	3810
ASICs used in front end boards	7620
High Voltage Cables	432
Low Voltage Cables	432
Signal Cables (one for 2 FE)	1905
Gas pipes (4 for 1 gap)	1728
Board distributing LV to the FE	288
Board giving the current lecture on the gap	144
DCT boards	~1570
HV/LV power supply	

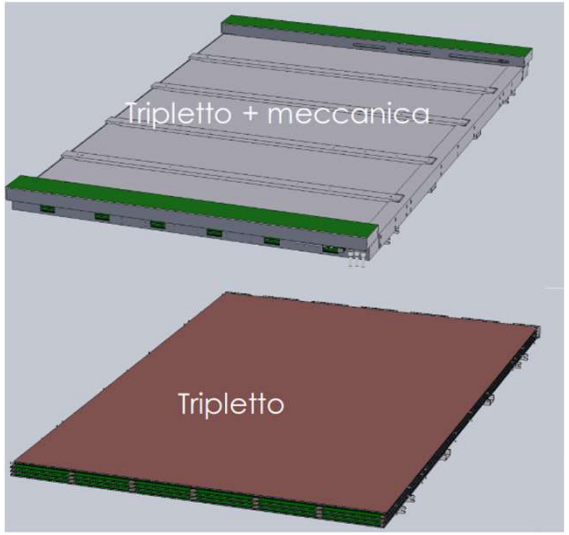
Responsabilità
P.L. RPC Chambers and FE:
G. Aielli e R.Cardarelli

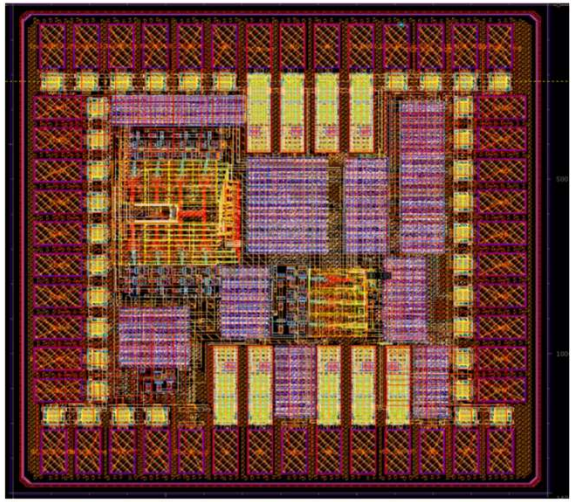
FASE2_ATLAS Attività in sezione

- Disegno layout gas gap (dist. Gas, dist. HV)
- Nuovo chip ASIC (lettura innovativa)
- Nuova Meccanica

- Produzione e Test Gas Gap
- Produzione e test schede FE
- Assemblaggio e costruzione
- Qualificazione RC degli RPC di produzione







Prototipi e Avanzamento FE ProjBI

BIL FIRST PROTOTYPE

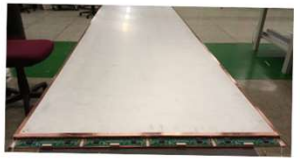
Prototype mounted, using the first gas gaps and strip panel produced, and BIS78 FE electronics

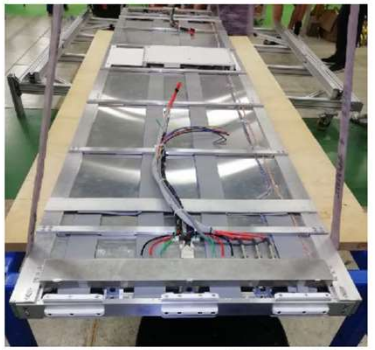
- Singlet dimensions: 2520 mm x 645 mm
- Read-out panel dimensions: 2496 mm x 645 mm
- 4 FE boards -> 32 Ch

The singlets have been integrated into the prototype mechanics:

- No conflicts between singlets and mechanics
- Singlets should be no thinner than 12.3 mm for the plates to apply the correct pressure
- The welding pads of the FE cannot be accessed with the assembled singlet
- Still open points about the connectors of the services

Cosmic Ray tests on the prototypes to be performed in the following weeks





29/06/2022 LORENZO MASSA, LUCA PIZZIMENTO - MUON PHASE II 9

RPC FE ASIC BI OVERVIEW

- **Transmission logic, serializer and transmission protocol**
  The data communication to the DCT is performed with a serial line for each channel
  latency budget, all the information to allow the reconstruction of the event and a possible trigger candidate.
  The transmission is encoded in manchester
- **Discriminator**
  Upgrade and optimization of the BIS78 discriminator
- **TDC (Time-To-Digital converter)**
  - Several VCO (Voltage Controlled Oscillator) configurations; The goal is to find the optimal configuration for our task considering the experiment and the interfaces requirements and constraints
  - Scaler
  - FlipFlop & Registers

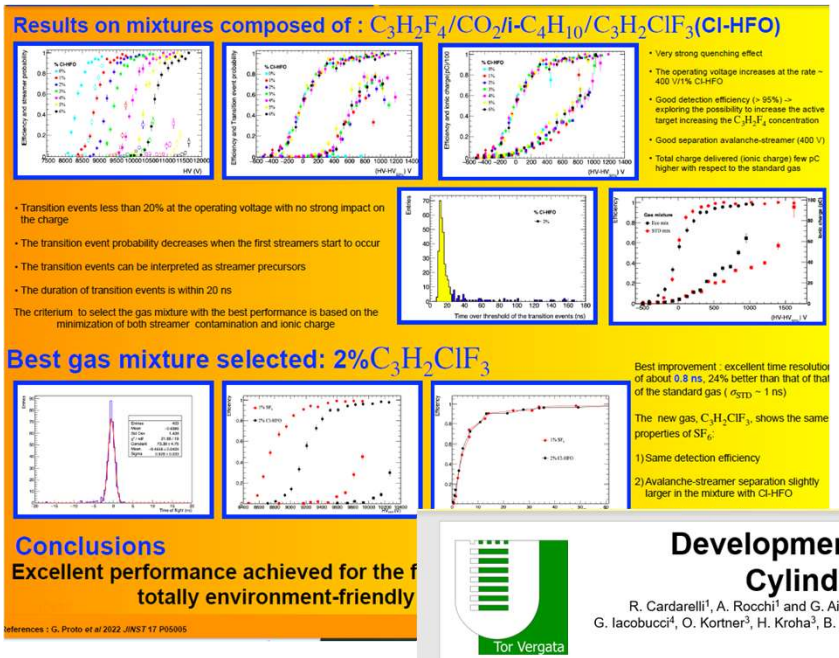
Foundry prototypes:

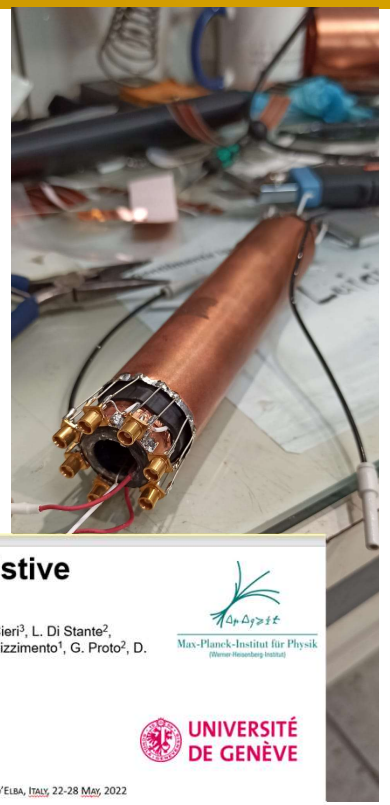
- September 2020: tested successfully
- March 2021: test ongoing
- July 2021: just delivered

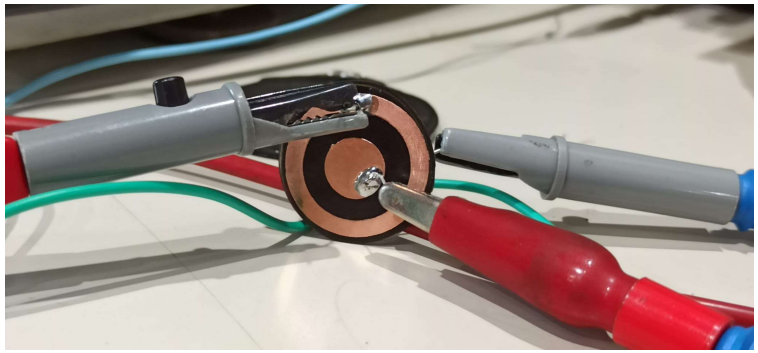
29/06/2022 LORENZO MASSA, LUCA PIZZIMENTO - MUON PHASE II 11

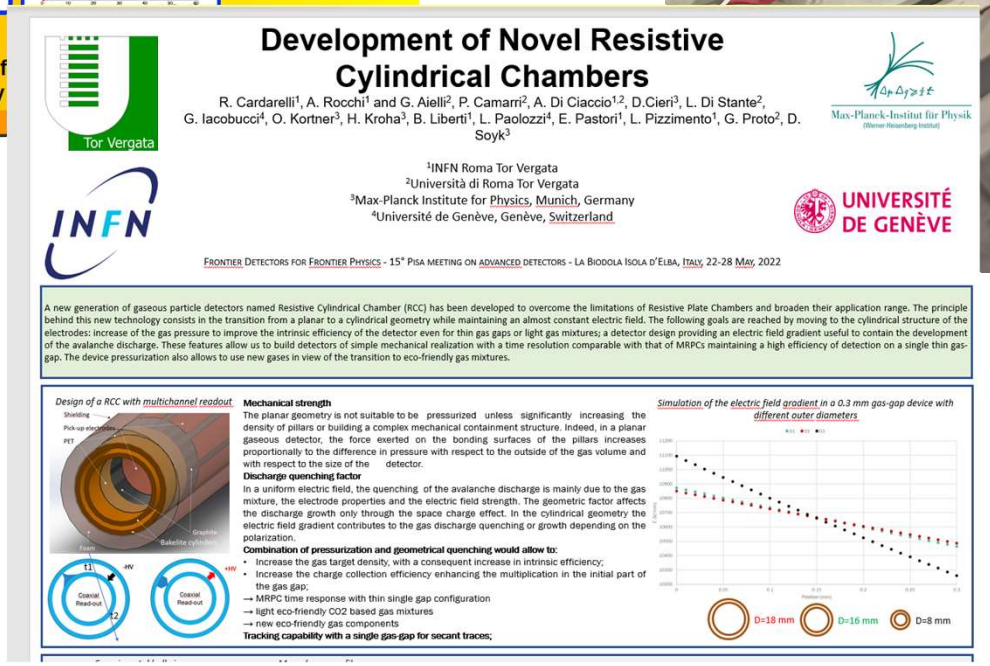
FASE2_ATLAS R&D

- **Search for alternative gas mixtures**
- **High rate capability with new materials**
- **Alternative layouts for high time resolution**









Fase2-ATLAS Anagrafica e Richieste 2023

cognome	nome	note	perc
Aielli	Giulio		90%
Camarri	Paolo	10 ore su	70%
Cardarelli	Roberto		90%
Cerrito	Lucio		10%
Di Ciaccio	Anna		80%
Di Stante	Luigi		80%
Liberti	Barbara		60%
Pastori	Enrico		20%
Pizzimento	Luca		90%
Proto	Giorgia		80%
Rocchi	Alessandro		90%
Sgarlata	Anna		100%
Travaglini	Marco		50%
Tusi	Enrico Maria		20%
Vanadia	Marco	20 ore pre	20%

Consumo e Inventario

Per Infrastrutture/Test/Prototipi

Richiesto 30 kEuro

Preventivi 2023

FTE di CSN1 sono 19,5 considerando anche sigle ‘sinergiche’,

Le sigle aperte sempre 4, si invitano i Responsabili Locali a finalizzare l’anagrafica

I fondi verranno chiesti con gli algoritmi definiti sui capitoli, Missioni, Inventariabile, Consumo, Pubblicazioni et al.