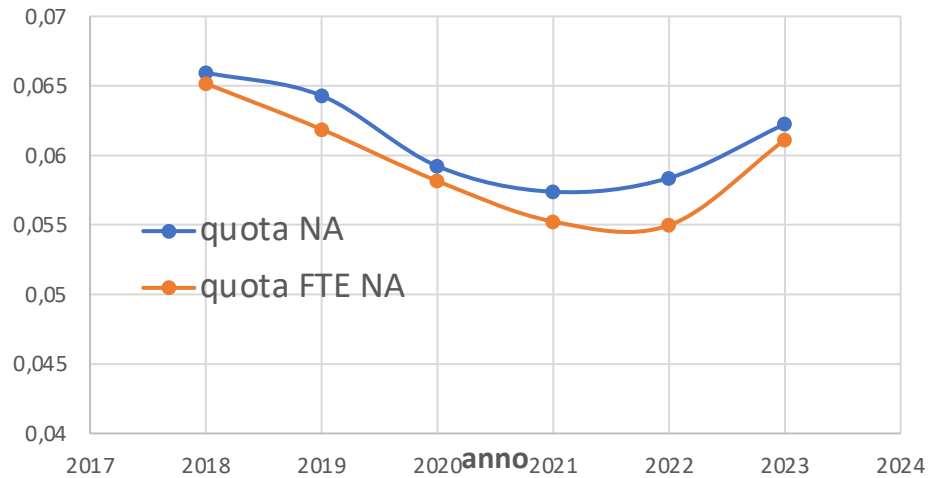
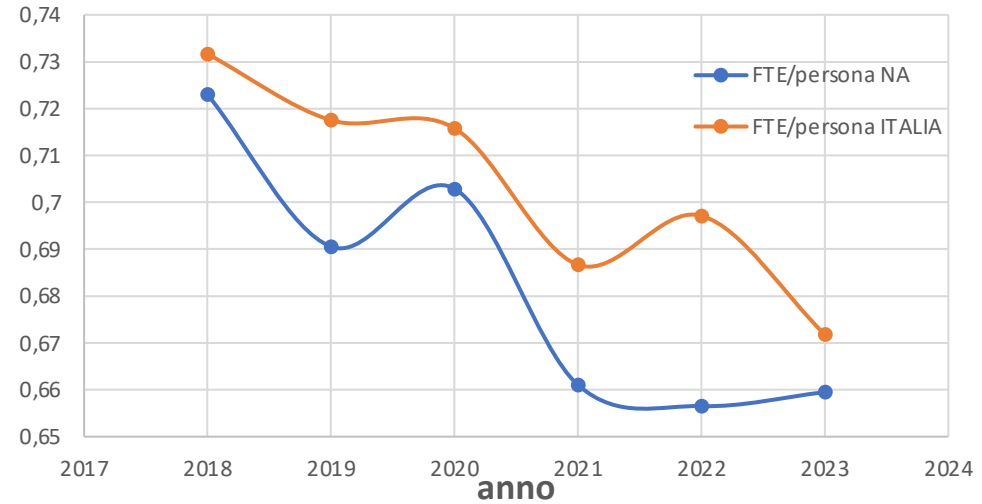
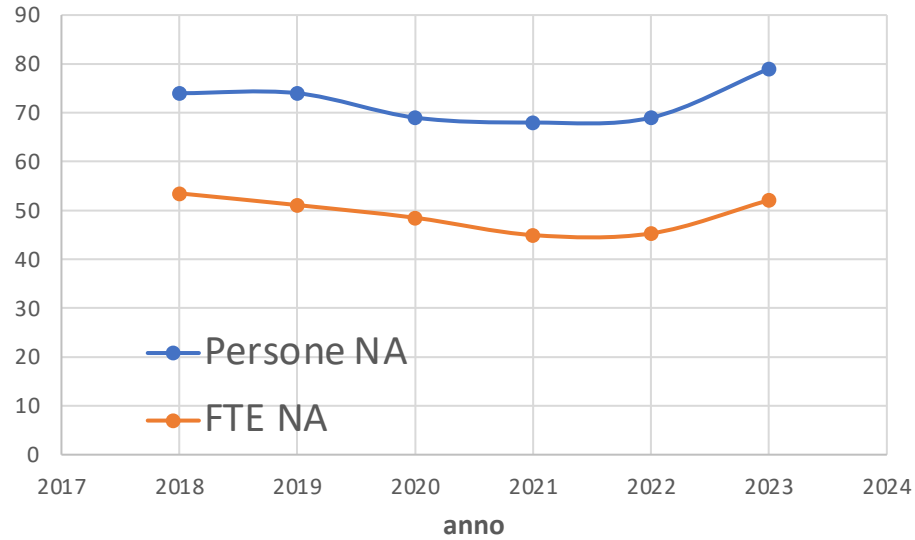


Report Attivita' Coordinatore CSN1 Napoli 2020-2023

F. Conventi

Grl Napoli Anagrafica e Attivita'



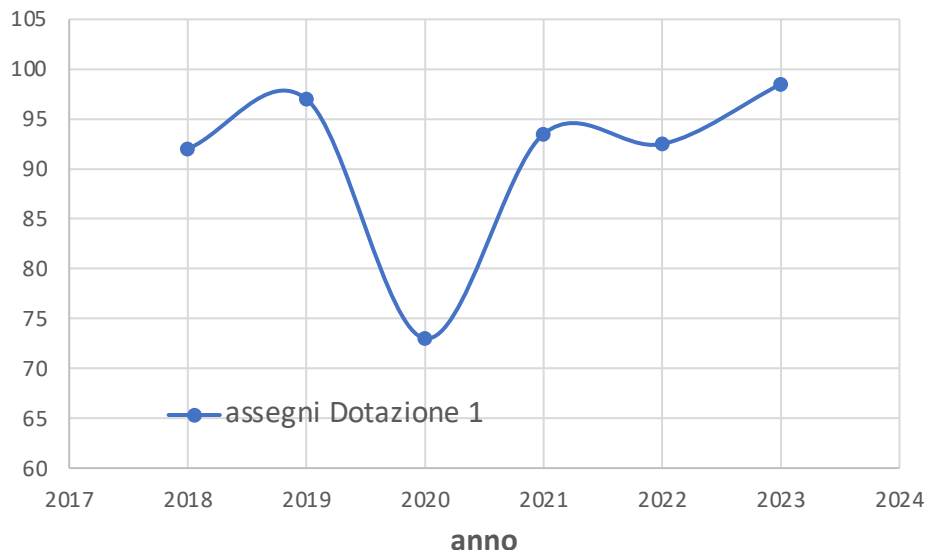
DUNE + T2K @ NAPLES 2023 = 8.4 FTE

Assegnazioni DOT1

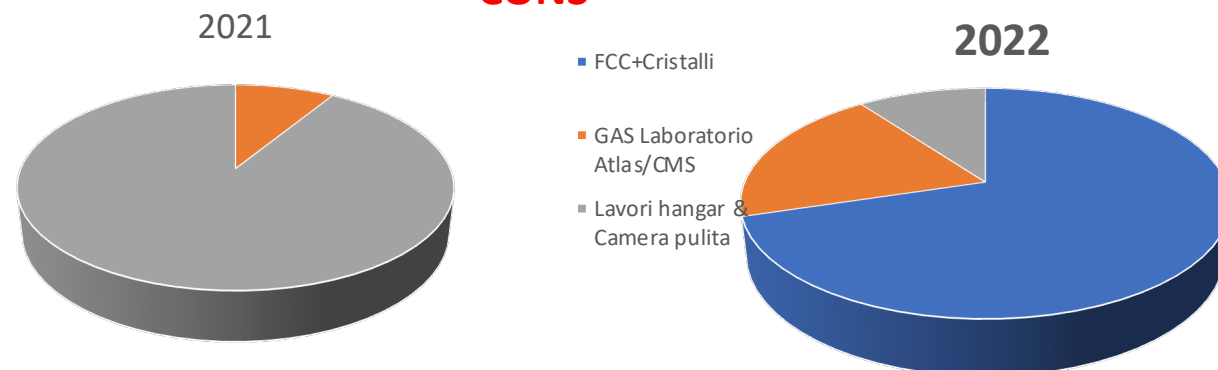
(tipica ripartizione 50% MISS, 30% INV, 20 CON)

| | Assegnazione (Keur) | Impegnato(Keur) |
|------|---------------------|-----------------|
| 2022 | 92,5 | 92,47 |
| 2021 | 101,5 | 88,3+(10) |

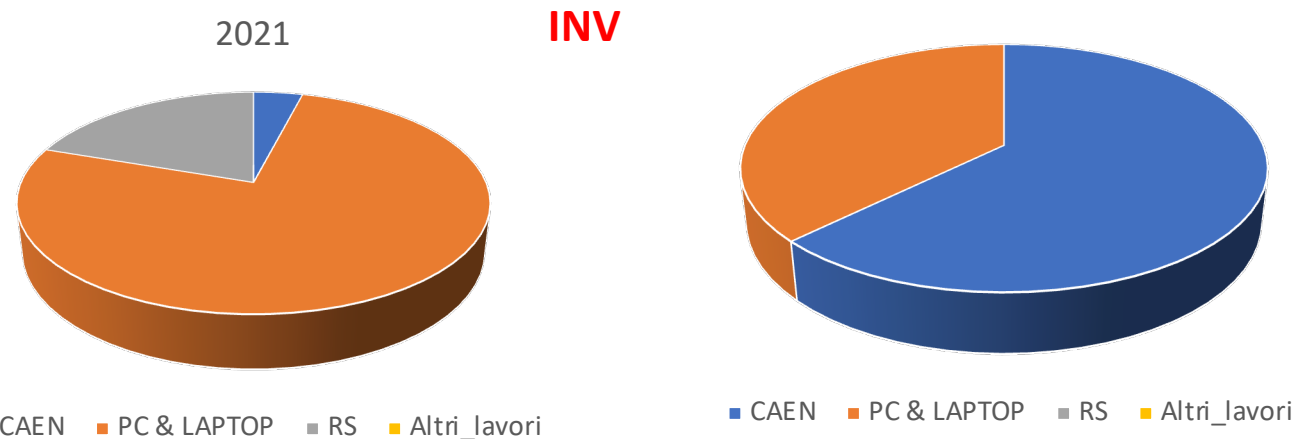
10 Keur x Restituzioni missioni



CONS

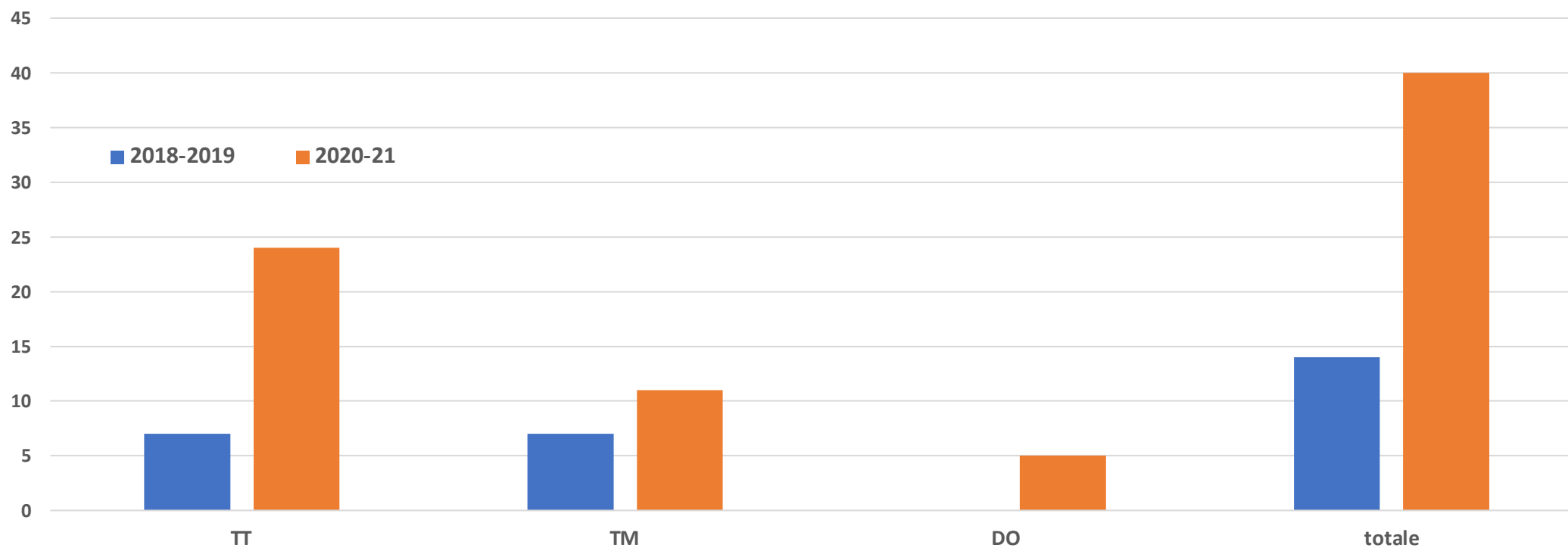


INV



- Le dotazioni sono costituite essenzialmente da:
 - Metabolismi**, calcolati mediante formule basate sul n. di FTE
 - Metabolismi per funzioni specifiche** (Presidente CSN1, Ref. non Coord, Osservatori in altre CSN, membri rappresentanti ufficialmente l' INFN in alcuni Comitati o Gruppi di Lavoro)

Attività di Tesi (Triennale, magistrale, dottorato) in GR1



(fonte: [database INFN tesi](#))

Attività' coordinatore in CSN1

~4 riunioni/anno della CSN1

- (riunione preventivi seconda sett. Luglio)
- (riunione bilancio seconda sett. settembre ~1 sett)
- nel 2023 riunione a Napoli
(<https://agenda.infn.it/event/36335/>)

Referaggio:

MU2E

PADME

Redazione minute riunioni CSN1



Le "nuove" sigle CSN1 a Napoli: **SND@LHC**

- Prima presentazione in CSN1 [riunione bilancio 2020](#)

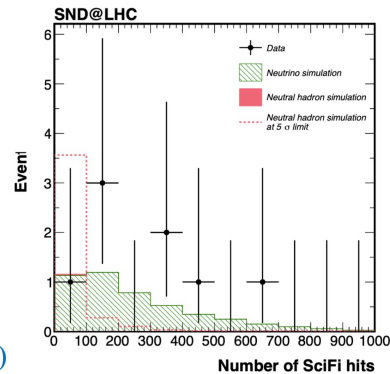
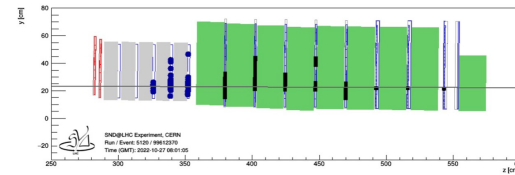
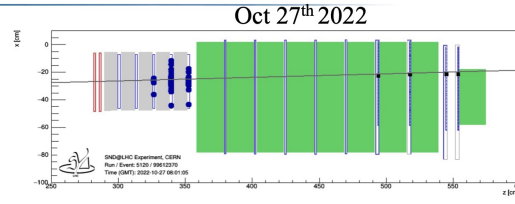
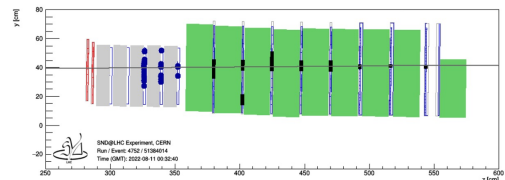
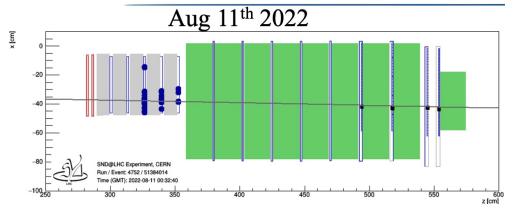
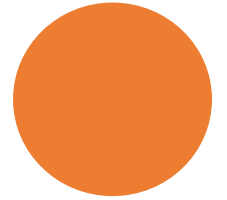
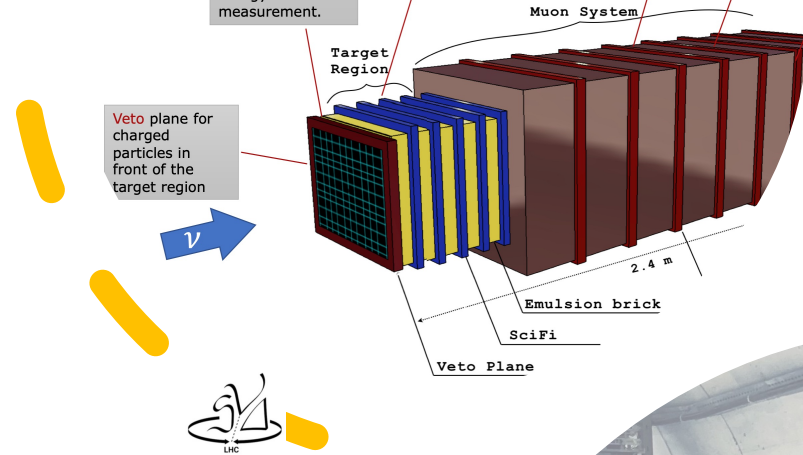
G. De Lellis Riunione CSN1 16-18 Maggio 2023
8 selected ν_μ CC candidates

SND@LHC:

Emulsion Cloud Chamber, emulsion and Pb/W absorbers for micrometric accuracy in the detection of τ and LDM, EM shower energy measurement.

SciFi with timing, provide time stamp to emulsion, records TOF information of events in the target region, track matching with ECCs. EM shower measurement as sampling calorimeter every $\sim 10 X_0$.

Muon system - hadronic calorimeter 8λ , sampling every λ , with target region $\sim 10 \lambda$.



Distribution of SciFi hits for ν_μ candidates with the MC expectation for ν events and background (augmented to the 5 sigma level)

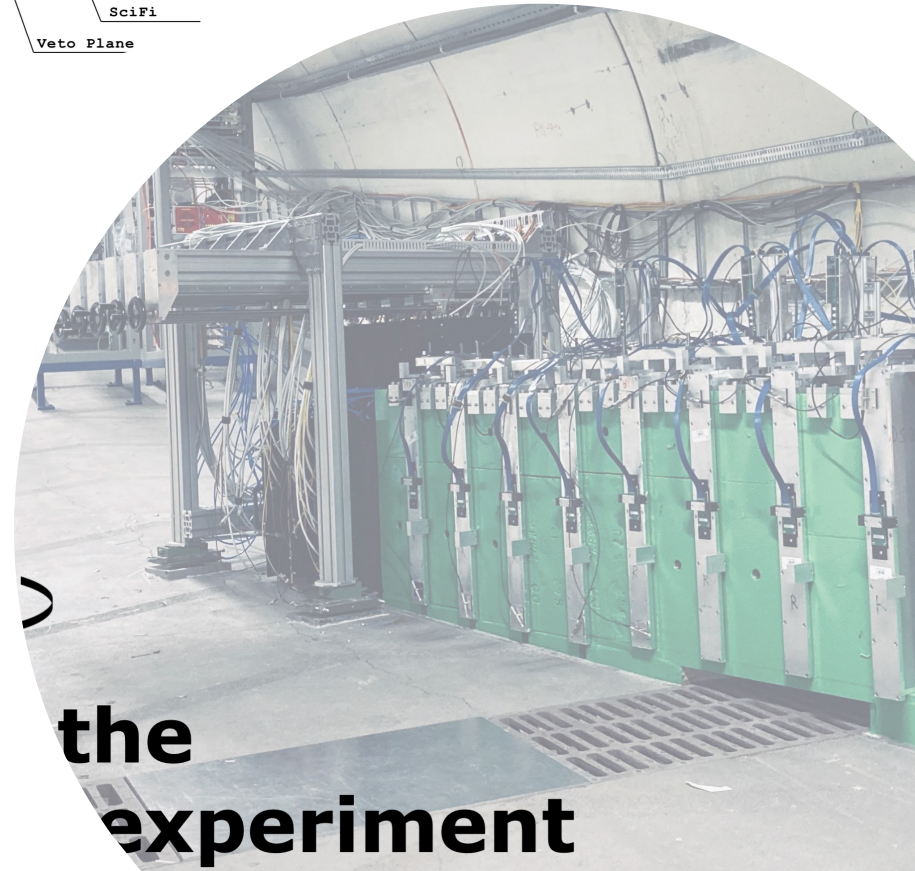
<https://arxiv.org/pdf/2305.09383.pdf>

8 observed events and an expected background
 $(7.6 \pm 3.1) \times 10^{-2}$

Background only hypothesis probability:

$$P = 1.48 \times 10^{-12}$$

7.0 σ observation

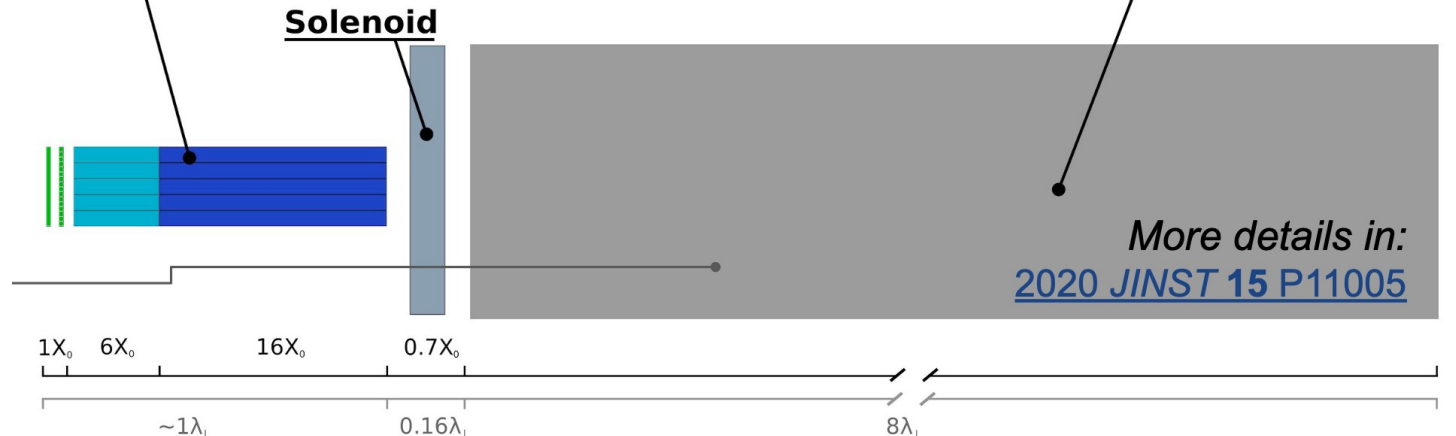
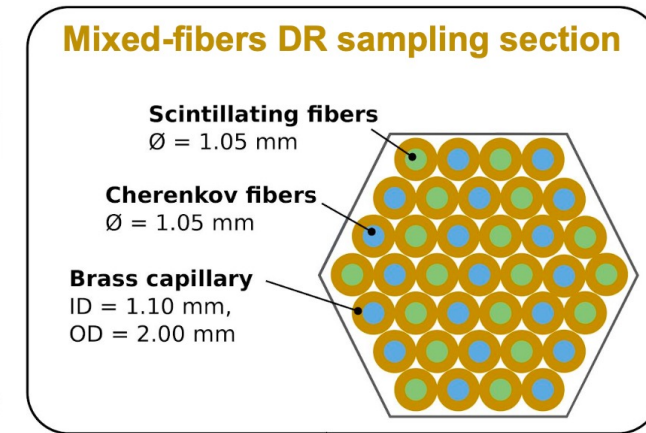
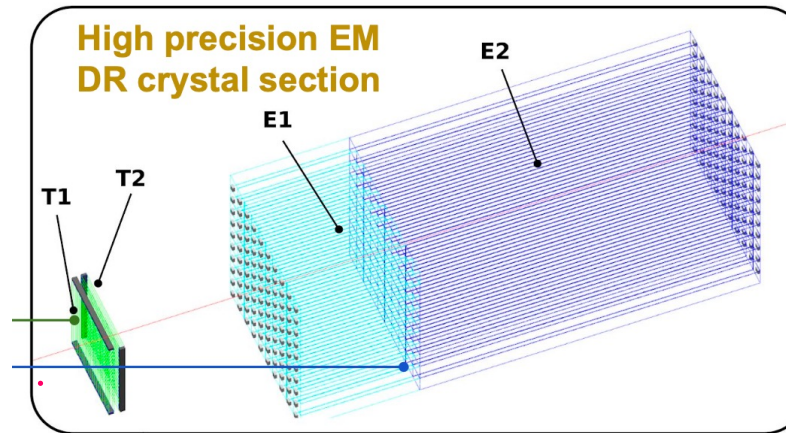
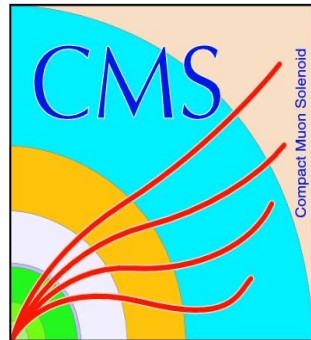


the
experiment

Le “nuove” sigle CSN1 a Napoli: **RDD_FCC**

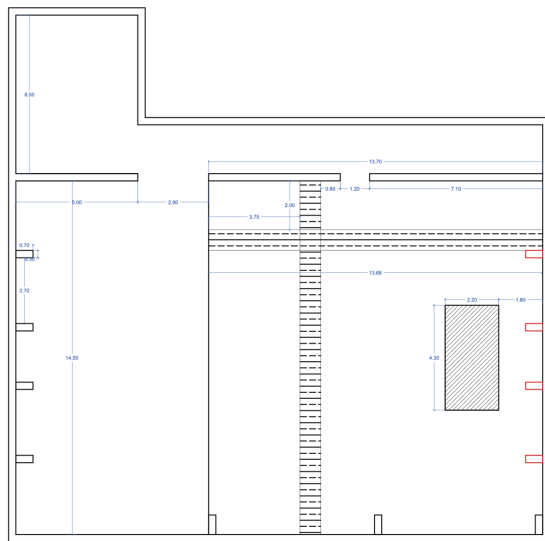
Attività' di R&D su calorimetria dual-readout calorimeter for future colliders

[Recenti seminari \(25/05/2023\) di M.Lucchini e R. Ferrari @ Naples](#)

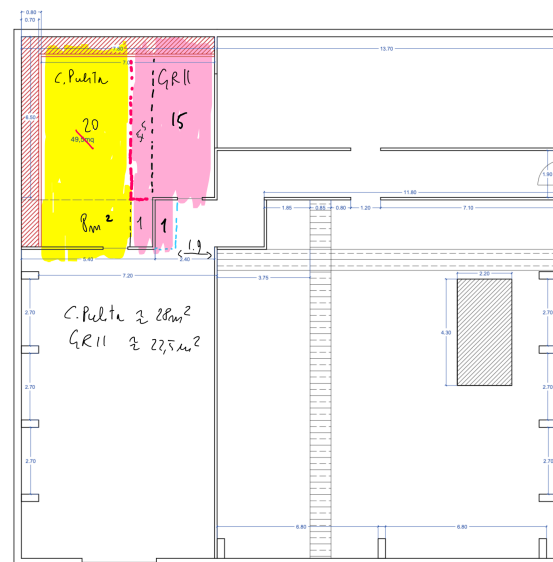


Laboratori e spazi: Hangar

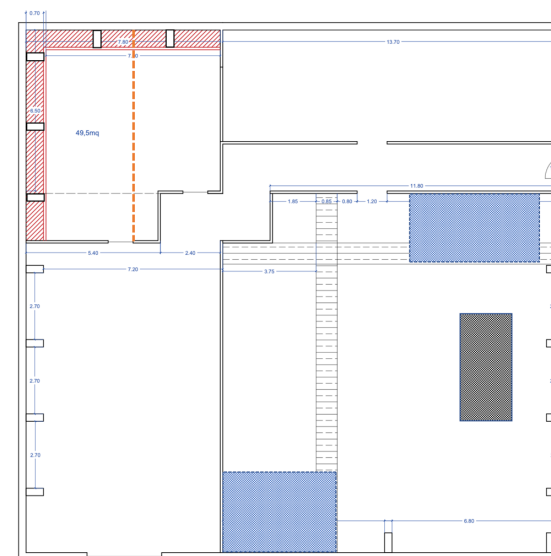
03/2021



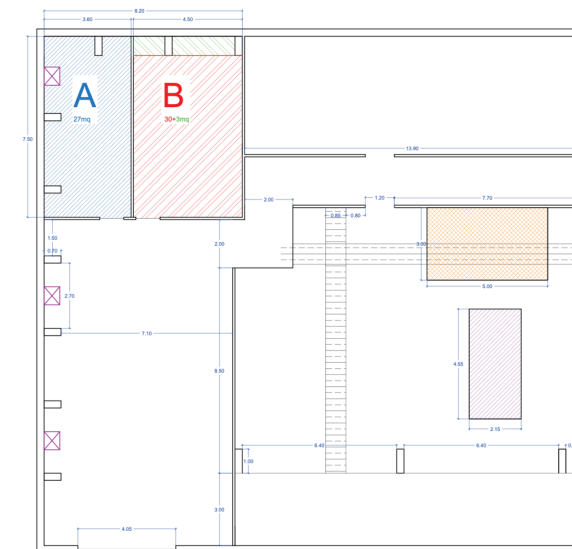
06/2021



07/2021



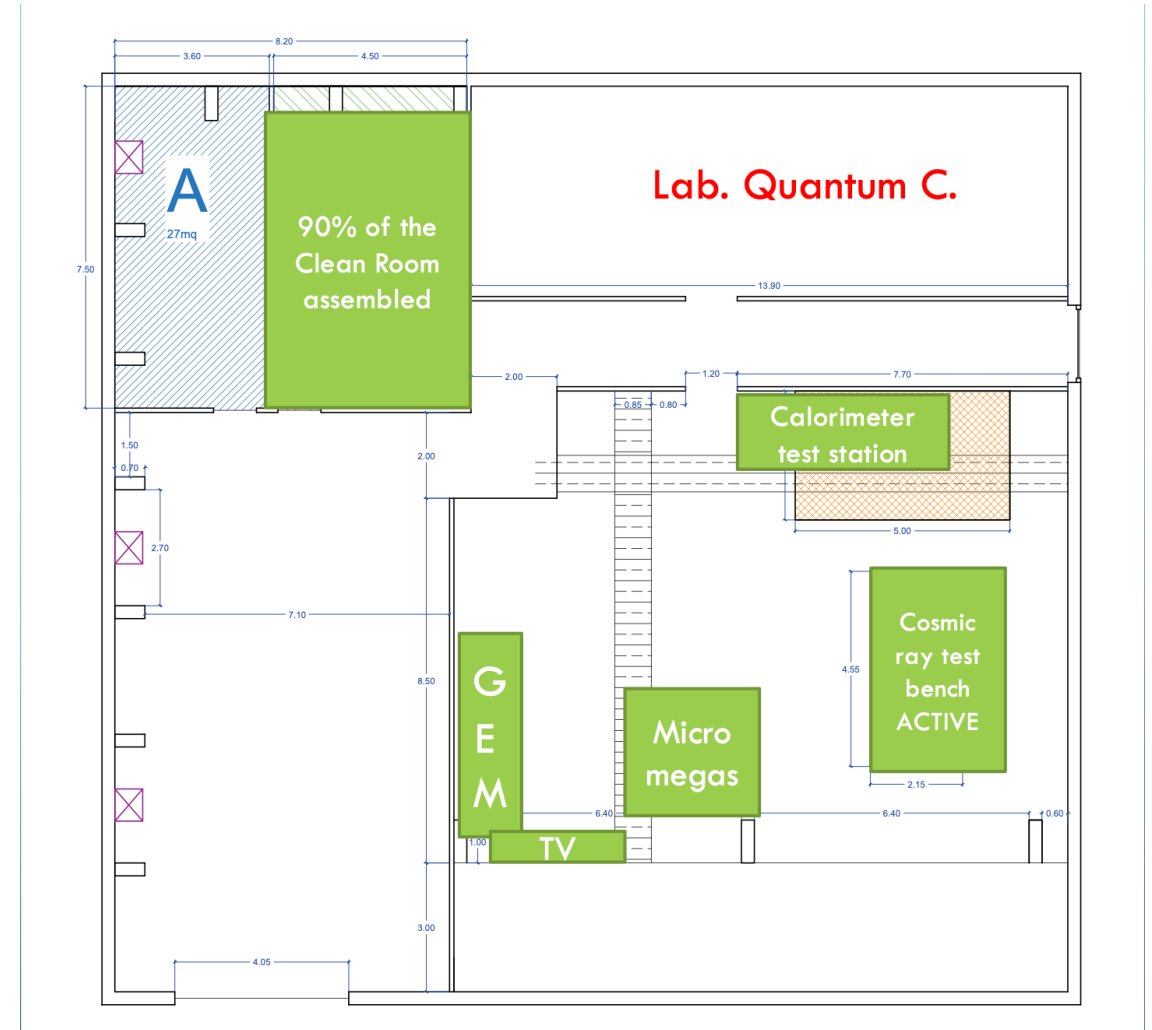
12/2021



Laboratori e spazi: Hangar

- ✓ Ripavimentazione completa (Federico II)
- ✓ Restyling area Gruppo-I – open space
- ✓ Eliminazione rifiuti – Razionalizzazione spazio
- ✓ Laboratorio B Clean Room (Gruppo-I) 33 m²
- ✓ Laboratorio A fotosensori (Gruppo-II) 27 m²
- ✓ Laboratorio esterno per Camera termica+storage per Darkside

02/2023



Laboratori e spazi: Clean Room @ Hangar

[B. Rossi – Riunione GRI Napoli 12/01/2023](#)

Fully funded by INFN in Dec 2021

~ 50KEur Fondi di sezione INFN + ~ 25KEur DTZ1 2021-2022

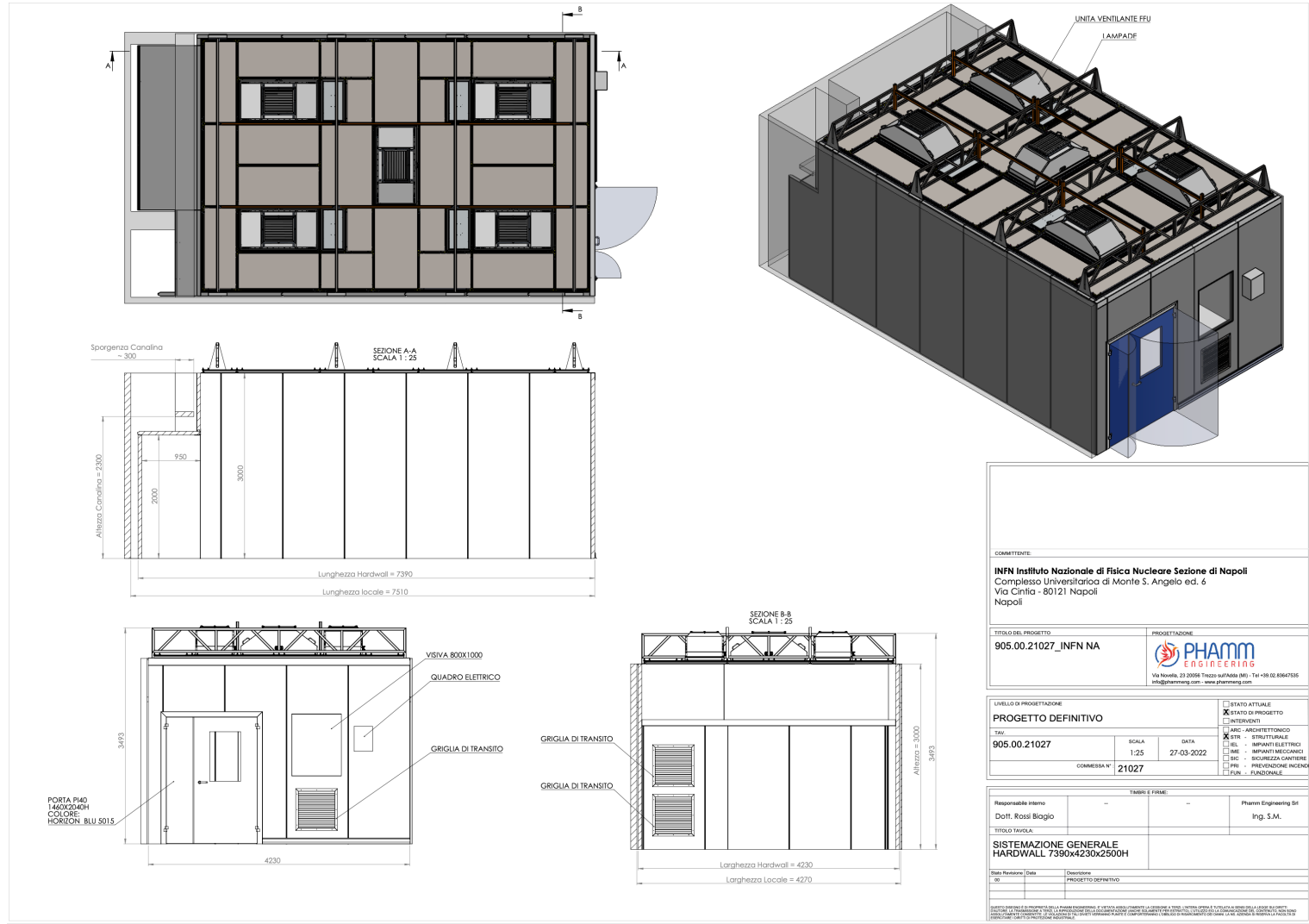
Assemblata al 90% →
completamento 12-16/06/2023 in schedula

Caratteristiche tecniche:

- ISO8 (almost ISO7) upgradable
- 5 filter units installed
- Two tables for mounting
- Two electronic desks
- Armadietto
- Panca per indossare i calzari

Possibili Upgrades:

- Oxygen meter
- Temperature and humidity sensors with display and ethernet connection



Laboratori e spazi: Clean Room @ Hangar

GENERAL PURPOSE EQUIPMENT

Crate NIM 12 slots

Waveform generator Keysight EDU33212A

Power supply Rohde&Schwartz 100V - 2A - 2 ch

Power supply Keysight 30V – 1 A - 3ch

Multimetro Fluke 175

Tester per componenti RS PRO ICT76

Misuratore temperatura

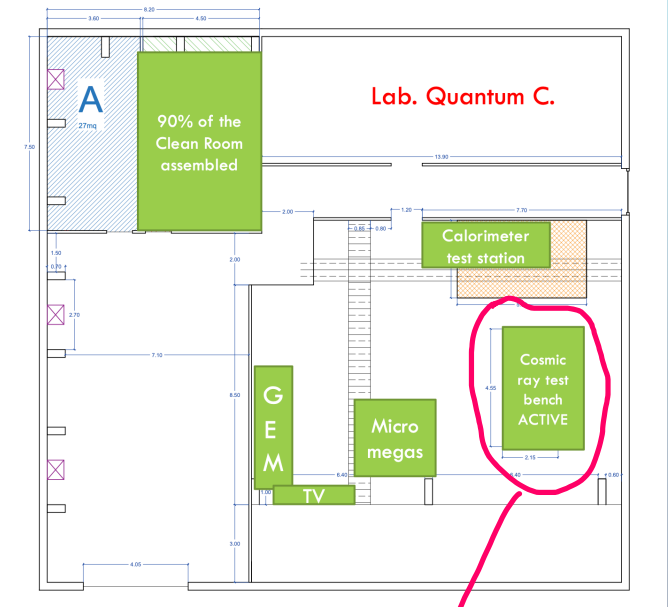
Gruetta mobile (if needed from LArNal)



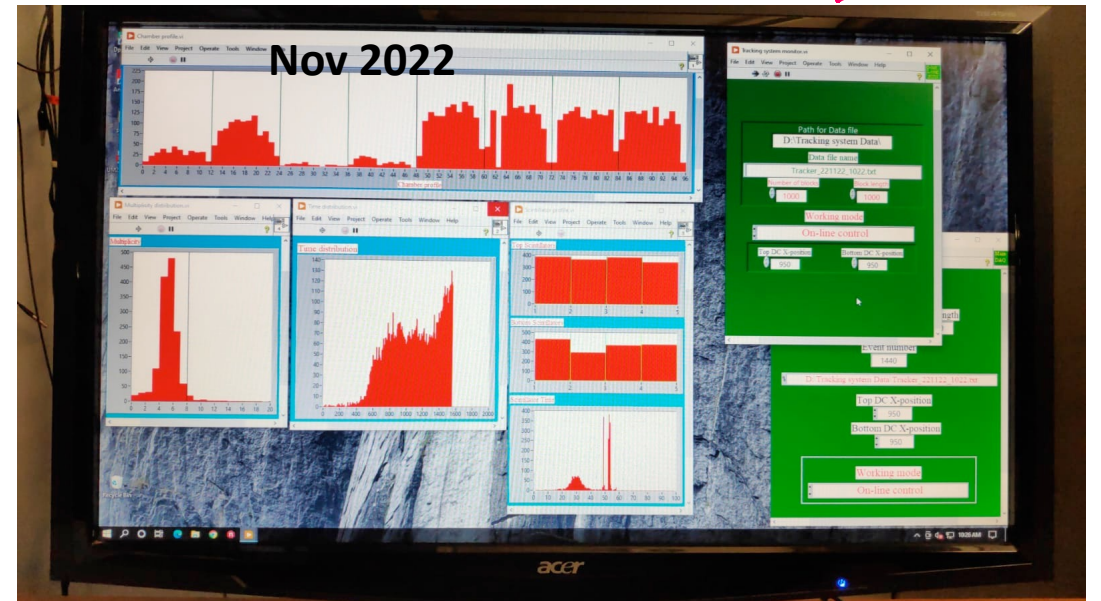
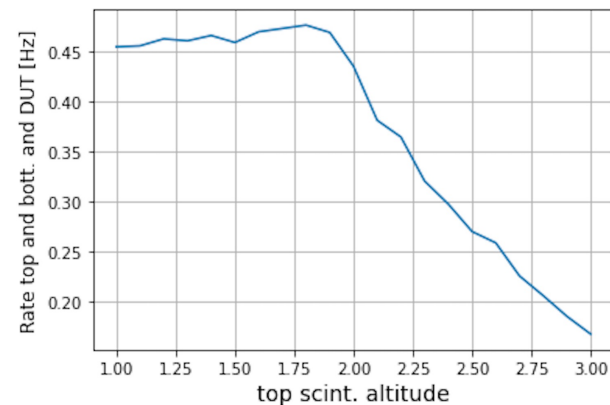
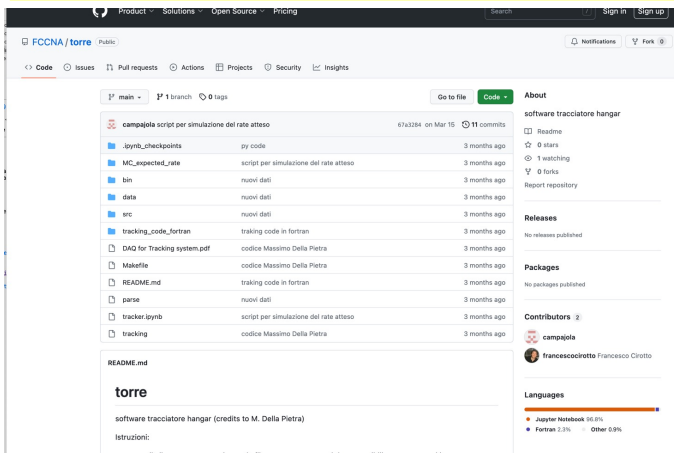
Laboratori e spazi: Torre di test (Hangar)

Nov 2022 fully refurbished (DTZ1):

- Read-out **OK**
- DAQ **OK**
- Detectors almost **OK**
- Small gas leak in top drift chambers
 - Intervento schedulato in Giugno 2023
- **Useful for calibration and QC of tracking detectors (MicroMegas, GEM) and for the development of the FCC calorimeter (crystal dual readout)**
- Installazione TV per monitor online degli eventi



Codice di simulazione in fase di aggiornamento su repository github



Dual Read-out Crystal calorimeter test bench

(joint effort ATLAS+CMS+BELLE2+NA62) (Hangar)

2 dimension crystal:

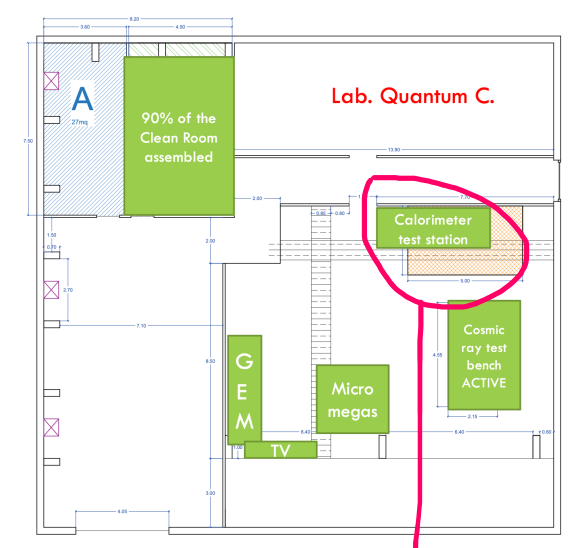
(short) 12x12x50 mm³ (x8)

(long) 12x12x150 mm³ (x8)

(cross section to match Hamamatsu SiPM standard sizes 3x3 or 6x6 mm²)

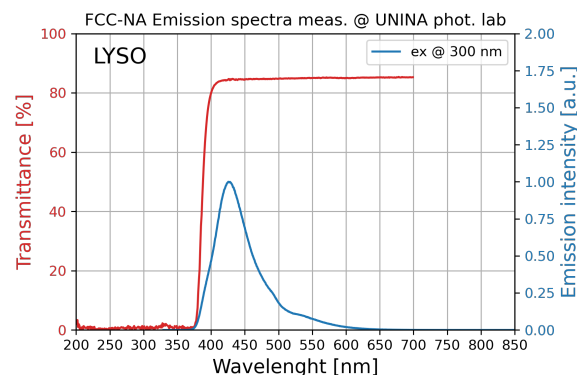
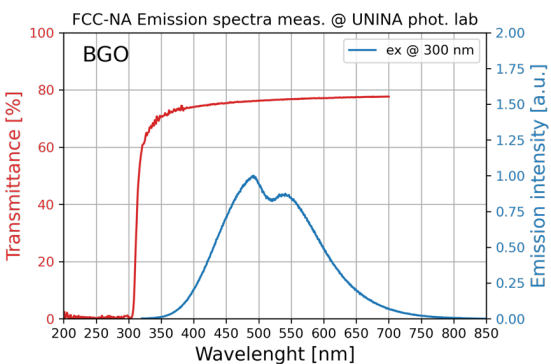
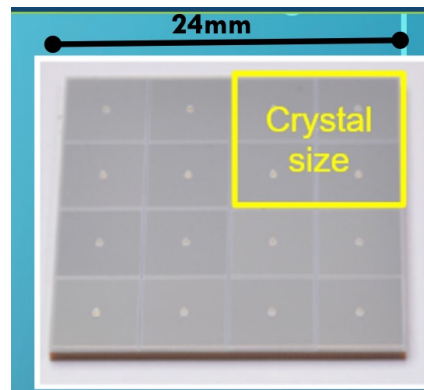
- **DONE** in 2022 - INFN Napoli funds (sezione + Dot. 1):
 - Procurement of Crystals, SiPMs, DAQ, readout, light reflectors (**about 30k€**)

| | SICCAS | | EPIC-CRYSTALS | | HILGER | |
|--------|--------|-----|---------------|-----|--------|-----|
| 12x12x | x150 | x50 | x150 | x50 | x150 | x50 |
| BSO | 2 | 1 | | 1 | | |
| PWO | 2 | 1 | | 1 | | |
| LYSO | | | | 1 | | |
| GAGG | | | | 1 | | |
| BGO | 2 | 1 | | | 2 | 1 |



Hamamatsu MPPC matrices of 24x24mm² size:

- 1x S14161-3050AS-08: 8x8 matrix of 3x3 mm²
- 2x S14161-6050AS-04: 4x4 matrix of 6x6 mm²



Front-end electronics almost ready to read 4 crystals

Organizzazione Second ECFA Workshop Paestum 11-13/10/2023)

<https://agenda.infn.it/event/34841/>

Second ECFA Workshop on on e⁺e⁻ Higgs/EW/Top Factories, October 11-13, 2023, in Paestum (Salerno)

11–13 Oct 2023
Hotel Ariston, Paestum
Europe/Rome timezone

Overview

Committees

Venue and
accommodation options

Registration

Participant List

Transportation options

Getting to know Paestum

The 2023 meeting of the ECFA study on physics and experiments at e⁺e⁻ Higgs/EW/Top Factories will take place in Paestum (Salerno) at the Ariston Hotel from **October 11 to 13, 2023**.

This meeting is intended to be an **in-person meeting**.

SECOND • ECFA • WORKSHOP on e⁺e⁻ Higgs / Electroweak / Top Factories

11-13 October 2023
Paestum / Salerno / Italy

- Topics:
- Physics potential of future Higgs and electroweak/top factories
 - Required precision (experimental and theoretical)
 - EFT (global) interpretation of Higgs factory measurements
 - Reconstruction and simulation
 - Software
 - Detector R&D

Registrations are now open under the appropriate tab - see "[ECFA Workshop 2023 registration](#)".

The registration fee, **including full board and single-room accommodation**, is 460 Euros. Another option foresees a shared double-room accommodation (400 Euros per person).

It is also possible to book accommodation in another hotel outside of the conference hotel/venue. In this case a registration fee of 250 Euros (including meals and coffee breaks) has to be paid. More detail can be found under the "[Venue and accommodation options](#)" tab.

Please note that, in case you plan to extend your stay, either before or after the workshop, you should arrange independently.

RHUM R&D – (sigla sinergica ATLAS)

Involved INFN sections:
Napoli & Roma Tre

RHUM
Resistive
High granUlaritY
Micromegas



Objectives of the project:

- Consolidation of resistive Micromegas technology with pad readout for operations at $O(10 \text{ MHz/cm}^2)$ rate;
- High-granularity low occupancy readout on pads of the order of mm^2 , capable of withstanding high radiation
- Stability of operation at high gain factors;
- Simplification of construction technique and realization of large area prototypes;

RHUM opens new collaborations and intents of interests from other INFN sections

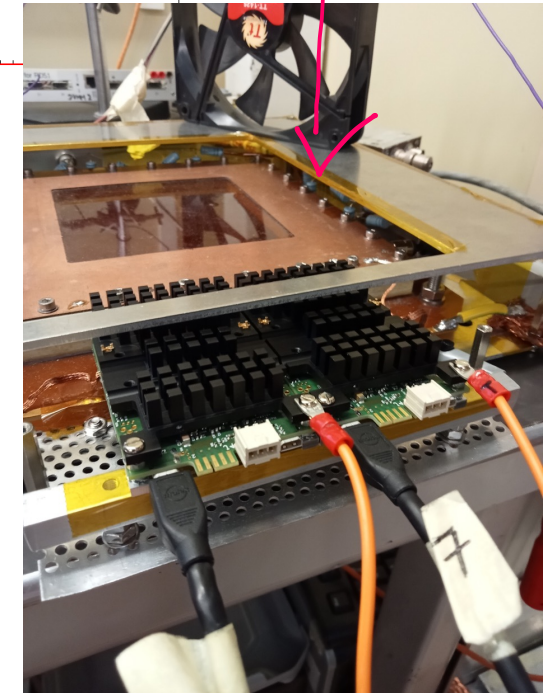
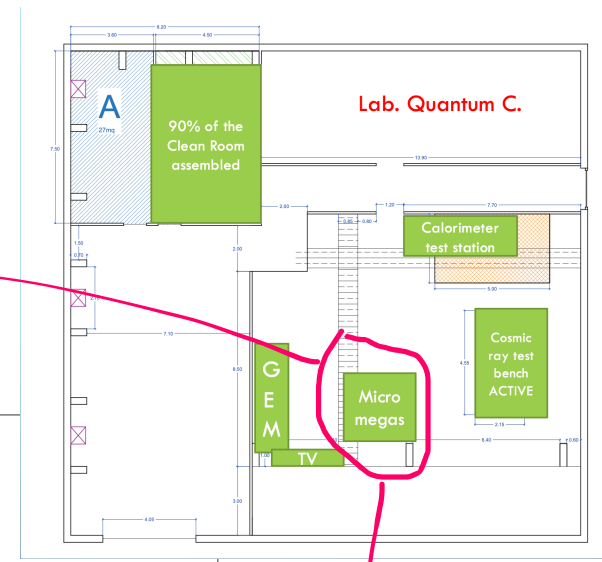
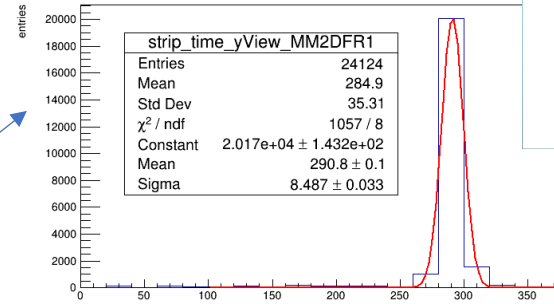
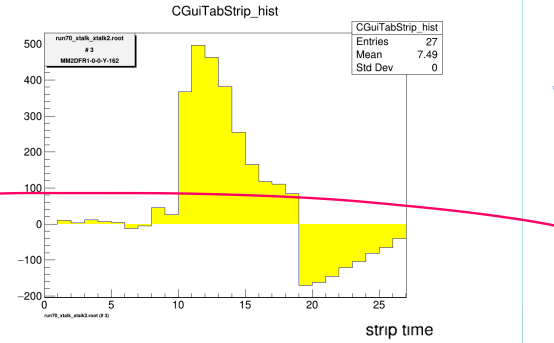
RD51 common project:
Development for Resistive MPGD Calorimeter with timing measurement
Involved INFN sections: Bari, Frascati, Napoli & Roma Tre
Resistive micromegas as active layer

DLC sputtering machine
@CERN

SHADOWS
Involved INFN sections: Frascati, Napoli & Roma Tre
Resistive micromegas as Upstream (Muon) Veto

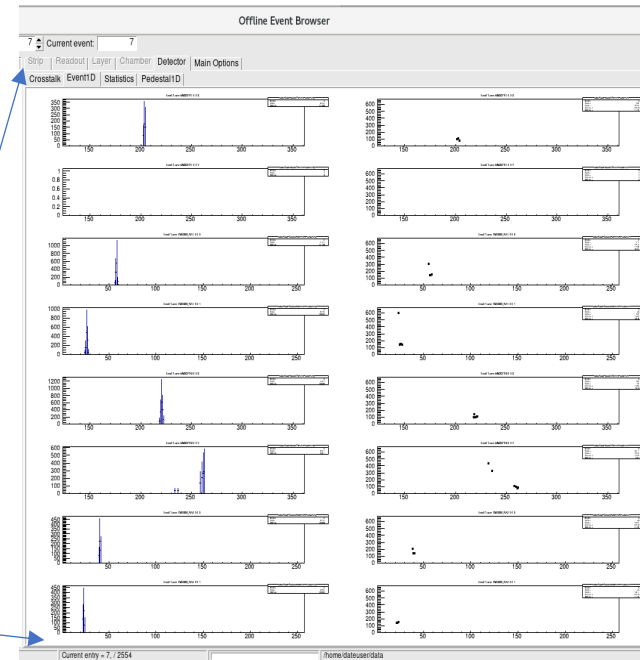
AMBER:
Involved INFN sections: Torino & Roma Tre
resistive micromegas as possible replacement of COMPASS MWPCs

RHUM R&D in Naples Lab



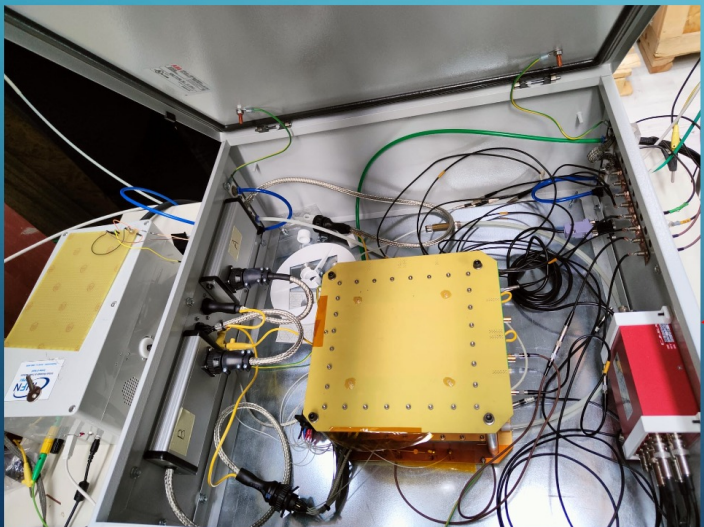
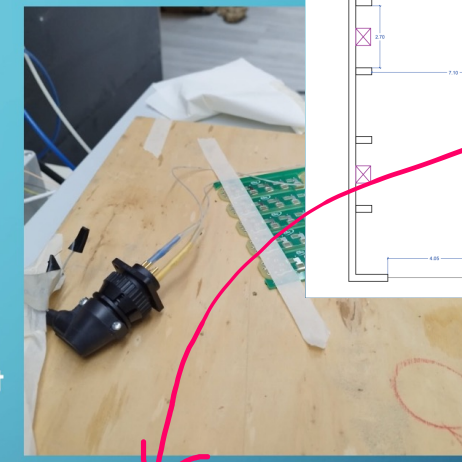
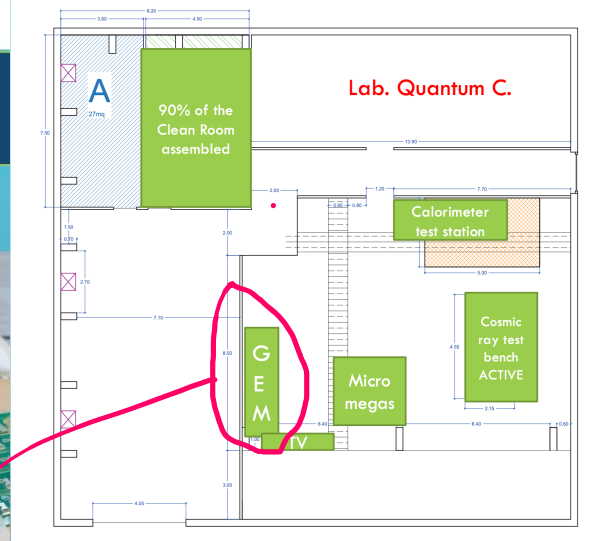
Ongoing activities:

- Additional timing studies
- Test of new readout electronics and validation of DAQ software upgrades
- Tracking of cosmics
- TB data analysis



CMS: GEM activities @INFN Napoli (Antimo)

- Quality check and Quality control of the HV filters for GE2/1
- GEM Electric field characterization through PICO
- Future plans:
 - Dedicated study for discharge propagation @ different GEM Working Point (PICO+Oscilloscope)



Fast ML with GPU and FPGA (joint effort ATLAS+CMS)

Introduzione alle reti neurali ed applicazioni su dispositivi elettronici

28 March 2022
Europe/Rome timezone

Enter your search term

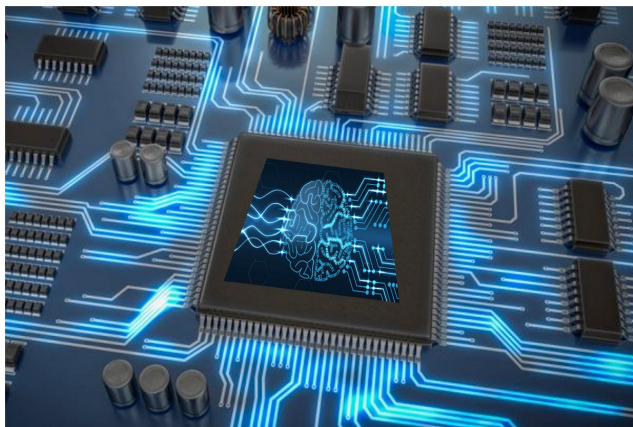
Overview

Timetable

Contact: Vincenzo Izzo,
Elvira Rossi

✉ vincenzo.izzo@na.infn.it

✉ elvira.rossi@na.infn.it



Il Corso Nazionale "Introduzione alle reti neurali e applicazioni sui dispositivi elettronici" fa parte del Piano Formativo Nazionale INFN approvato per il 2022.

Il corso è organizzato dalla sezione INFN di Napoli, si terrà in modalità telematica e si articola in tre moduli:

- **Parte 1: 21 - 23 Marzo 2022 - Introduzione ML in elettronica:** Corso di Python
- **Parte 2: 6-8 Aprile 2022 - Introduzione ML in elettronica:** Corso di Machine Learning
- **Parte 3: 21 - 22 Aprile 2022 - Introduzione ML in elettronica:** Corso di Machine Learning in sistemi di trigger

<https://agenda.infn.it/event/29903/>

<https://agenda.infn.it/event/32352/>

II Edizione: Introduzione alle reti neurali e applicazioni sui dispositivi elettronici: Corso di Machine Learning

15-17 Nov 2022
Europe/Rome timezone

Enter your search term

Overview

Timetable

Contribution List

Contact: Vincenzo Izzo,
Elvira Rossi

✉ vincenzo.izzo@na.infn.it

✉ elly@na.infn.it

- **Parte 1: 24 - 26 Ottobre 2022 - Introduzione ML in elettronica:** Corso di Python
- **Parte 2: 15-17 Novembre 2022 - Introduzione ML in elettronica:** Corso di Machine Learning
- **Parte 3: 6-7 Dicembre 2022 - Introduzione ML in elettronica:** Corso di Machine Learning in sistemi di trigger

Obiettivi del corso: Il corso ha come obiettivo l'introduzione al Machine Learning per l'analisi dei dati, con particolare riguardo agli algoritmi di Deep Neural Network e Convolutional Neural Network.

Argomenti:

- **Lezioni frontali:** Introduzione al Machine Learning e agli algoritmi principali, Classificazione e regressione, gestione di Over/Under Fitting, Misura delle performances, Data processing, Introduzione alla DNN e alla CNN.
- **Esercitazioni:** Introduzioni alle principali librerie utilizzate per la gestione e visualizzazione dei dataset (pandas, scikit-learn, matplotlib) e per il training (keras, tensorflow), esercitazione su DNN e CNN.

Prerequisiti: Conoscenza base di Python

Struttura del Corso: 12 ore di lezione, suddivise in 6 ore di lezioni frontali e 6 ore di esercitazioni.

Docenti: Silvia Auricchio, Antimo Cagnotta, Francesco Carnevali, Francesco Cirotto, Roberto Schiattarella

Progetto generale: [National Centre on HPC, Big Data and Quantum Computing project](#)

Dettagli del Progetto nella [Presentazione Gianpaolo Carlino Ila riunione di fine anno](#)

Suddiviso in 10 Spoke tematici + lo Spoke 0 per creare l'infrastruttura

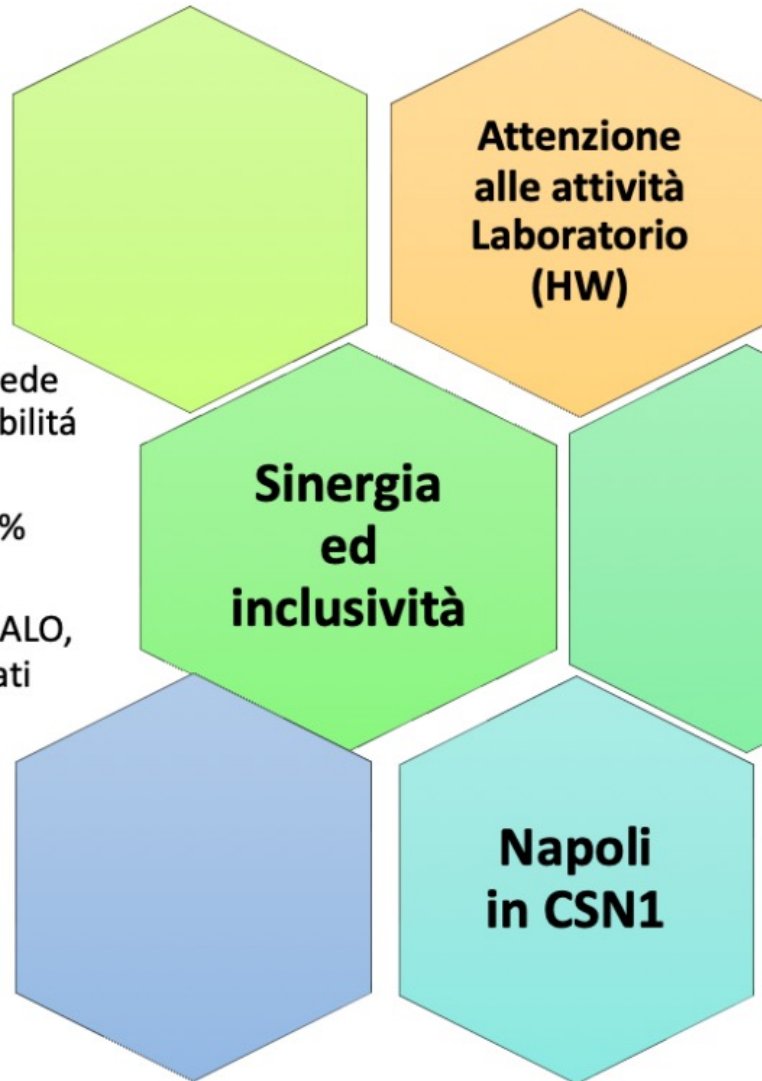
Concorsi da tecnologie ICSC -> 1 posizione in spoke 0 + 1 posizione in spoke 3 + 1 *posizione in Spoke 2 (presa di servizio inizio Luglio)*

Concorsi RTDA ICSC -> una posizione in Spoke 2 (concorso a breve)

Scopo di Spoke 2: The Spoke intends to address the needs of theoretical and **experimental physics with accelerators**, astroparticle physics with space- and ground-based detectors and gravitational wave investigation designing, developing and testing solutions apt to the current and next-generation experiments, and fitting the opportunities provided by the PNRR and the National Centre (CN) "Big Data, HPC and Quantum Computing".

Attività in Spoke 2 di interesse per Gruppo 1 in corso:

- **Deploy di una Analysis Facility e test con Analisi ad alto throughput su CPU+GPU:**
 - creazione di una Analysis Facility sulle risorse locali da estendere sulla INFN Cloud e sulle risorse del centro appena saranno disponibili
 - **collaborazione ATLAS+CMS a Napoli** per la definizione e il test di use case sulla Analysis Facility a Napoli, da estendere poi sulla INFN Cloud e sulle risorse del centro appena saranno disponibili
- **Altre attività:**
 - Development of ultra-fast trigger and reconstruction algorithms running of FPGAs
 - Porting of reconstruction software to GPUs
- **Dettagli nel talk:** <https://agenda.infn.it/event/35870/#5-unina>



Reshaping Hangar >90% (...)
Forte criticità sugli spazi almeno nel breve termine
Manpower e presenza di studenti/dottorandi su HW ancora fattore critico

Percorso graduale richiede uno "sforzo" di disponibilità e cambio paradigma
Posizione HEP non 100% favorevole
Hangar, Attività R&D CALO, sviluppi sw primi risultati positivi

Asimmetria tra alcune attività ben rappresentate o con ruolo guida (calcolo, SND ad esempio) e altre meno..
"Nuove" attività ben accolte in CSN1

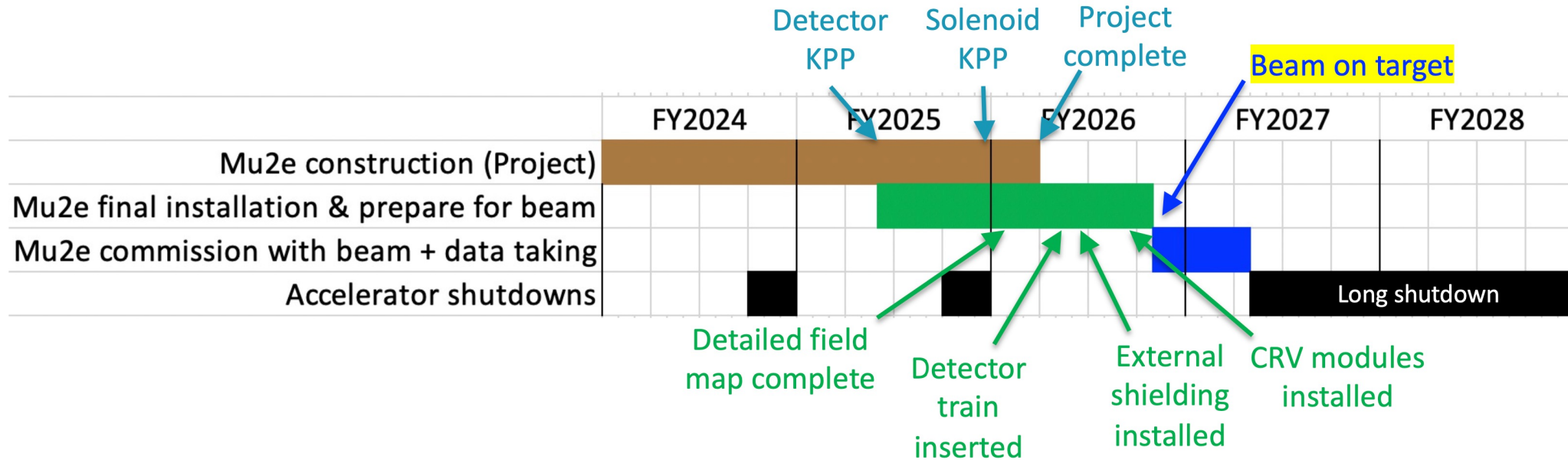
METABOLISMI: CRITERI UTILIZZATI

- Tutti i calcoli sono in k€, con arrotondamenti a 0.5 k€
- **MISSIONI** = $(\text{FTE} + 0.7) * 0.6 + \text{DIST}$
 - **GETTONI PER RESPONSABILITÀ:**
 - 1.5 k€ per ciascun referee non coordinatore
 - 2 k€ per ciascun Osservatore nelle altre CSN
 - 30 k€ per presidente CSN1
 - Per membri di nomina/rappresentanza INFN riconosciuta in comitati:
 - ECFA 4k€, PDG 4k€, ACCU 2k€, LHCC 4k€, SPSC 3k€, GLV 1.5k€, RRB 8k€, ...
- **CONSUMO** = $(\text{FTE} + 6.0) * 0.36$
- **INVENTARIABILE** = $5.2 * \text{LN}(\text{FTE}) + \text{FTE} / 3.8 - 3$

| DIST | |
|----------------|----|
| Sede | k€ |
| CA, CT, LE, TS | +3 |
| BA | +2 |
| RM1/2/3, LNF | -2 |
| Altre sedi | 0 |

| | PUBBLICAZIONI | SEMINARI |
|---------|---------------|----------|
| FTE | k€ | k€ |
| < 15 | 1 | 2 |
| 15 - 45 | 2 | 2 |
| > 45 | 3 | 2 |

Mu2e timeline - operations included



- Mu2e and the Lab committed to achieve the following goals
 - **Complete the project in 2025**
 - **Get data on tape in 2026**
 - **Process, analyze, and publish first results in 2027**