FCC@NA BeamTest: Situation so far

Beam test @ CERN

- **Marco Lucchini and the group from Milano Bicocca (MiBi)** has asked for 1 week of beam test in the second half of July (3-4th week)
- Confirmation will be given on **March 13th**
- **He planned a chat (tbc from our side) for next Monday, 12/02 ⇐ why we are here today!**

Beam test @ DESY in April

- Marco plans to go 1-2 days only as “witness”.

Beam test @ BTF

- request for Summer to be opened in March.
- We can call it as “backup” in case CERN request is not accepted OR decide to call it either way.

→ Dates should be August OR september

- We should decide this after we coordinate with the group from Milano

CERN BeamTest: Possibilities

Option A:

Go with a **ONE shared setup**
Naples + Milano

GOOD

-Stronger requests
-Strengthen the collaboration.
- We can provide “complementary” parts of the setup (mechanics, electronics etc)

BAD

-Need to coordinate the “share” of the setup
-We will not test the exact setup we have here
-Will need a period of testing of the setup in Milano (or Napoli) before shipping!

Option B:

Go with **TWO complementary setups**
1 Naples 1 Milano

GOOD

-Build and test setup “in house”
-We have more time to R&D before freezing the setup
-Independent checks

BAD

-If need to make requests, they will double
-Might be strict in time
-Will have more exp. issues in general
-Less collaboration

What we have / what MiBi has

Naples setup

→ Latest report from Marcello:

https://agenda.infn.it/event/39011/contributions/218518/attachments/114401/164182/2023_12_18_acquisti.pdf

→ Plus: we can discuss with the services about a goniometric system

Milano Setup

→ Report from last discussion with Marco:

→ MiBi Their tentative plans for test beam

https://agenda.infn.it/event/39801/contributions/222255/attachments/115673/166513/lucchini.pdf

→Calvision (Fermilab 2023)
https://agenda.infn.it/event/39801/contributions/222255/attachments/115673/166512/calvision.pdf

From Marco's slides

Hardware available at UNIMIB

In hand

- Crystals from SICCAS (1 pcs for each type)
  - BGO: 1x1xL cm^3 (L=1,5,13,16)
  - BSO: 1x1xL cm^3 (L=1,5,13)
  - PWO: 1x1xL cm^3 (L=1,5,13)
- Crystals for tagging/trigger (from CPI):
  - LYSO plates (1x1x0.3 cm^3), LYSO pixels (3x3x5 mm^3)
- SiPMs / filters
  - 3 FBK NUV-HD, 4x4 mm^2, 40 um cell size
  - 3 FBK RGB, 4x4 mm^2, 40 um cell size
  - Few HPK 3x3 mm^2 15 um / 10 um cell size
  - 2 Hoya 056 filters (for PWO)
  - 2 Hoya U330 filters (for BGO/BSO)
- 2 Advansid SiPM evaluation boards (1ch./board)
- DRS4 evaluation board (4 ch. digitizer)
- Preshower Cu blocks (X_0=1,3,7,11)
- Raspberry Pi for temp humidity monitoring

From Marco's slides

Hardware required (missing)

- Power supplies
  - Need 1 PSU to provide +5/-5V to all boards
  - Need 2/3 Keithleys for SiPM bias voltage
    - 1 for two SiPMs on crystal
    - 1 for LYSO trigger and plastic scint
- Need Lauda cooler for box
- Need a 4ch. oscilloscope:
  - S(cintillation) SiPM on crystal
  - C(herenkov) SiPM on crystal
  - Front trigger SiPM
  - Rear trigger/alignment SiPM
- Need a DAQ PC to remotely connect to oscilloscope?
  - Can dump "trends" of signal integrals and amplitude of all channels in txt for most of events
  - Dump pulse shapes for a subset of the events