Possible activity @LNF

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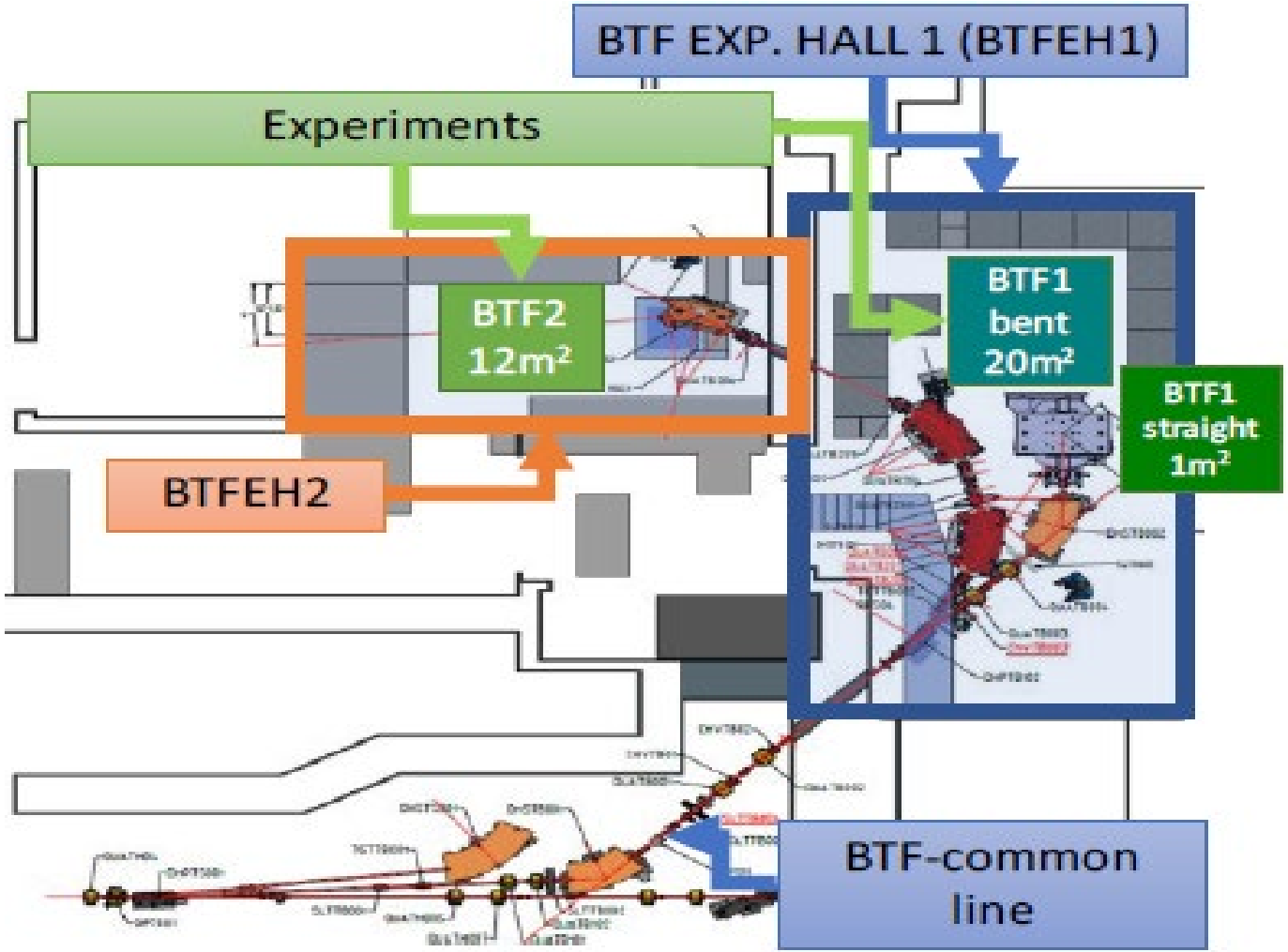
INFN-LNF

27 Marzo 2025

TEST @BTF

BTF transfer line
and experimental areas



https://inspirehep.net/literature/2686013

BTF beam parameters

Parameters	BTF1 Time sharing		BTF1 Dedicated		BTF2 Time sharing	BTF2 Dedicated
	With Cu target	Without Cu target	With Cu target	Without Cu target	With Cu target	With Cu target
Particle Type (Dependance)	e^+ / e^- (User)	e^+ / e^- (DAΦNE status)	e^+ / e^- (User)		e^+ / e^- (User)	
Energy (MeV)	25–500	510	25–700 (e^-/e^+)	167–700 (e-) 250–550 (e+)	25–500	25–700
Best Energy Resolution at the experiment	0.5% at 500 MeV	0.5%/1%	0.5%	Energy dependent	1% at 500 MeV	
Repetition rate (Hz)	Variable from 1 to 49 (DAΦNE status)		1–49 (User)		Variable from 1 to 49 (DAΦNE status)	1–49 (User)
Pulse length (ns)	10		1.5–320 (User)		10	Expected 10-100
Intensity (particle/bunch)	$1–10^5$ (Energy dependent)	1 to 10^7 / $1x10^{10}$	$1–10^5$ (Energy dependent)	1 to 10^{10}	$1–10^4$ (Energy dependent)	
Max int flux	$1x10^{10}$ part./s				$1x10^6$ part./s	
Beam waist size(mm)	0.5–55 X / 0.35–25 Y (vacuum window dependent)				1x1	
Divergence (mrad)	Down to 0.5				Down to 0.5	

https://www.lnf.infn.it/sis/preprint/getfilepdf.php?filename=INFN-17-16-LNF.pdf

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BEAM TEST OF ALPIDE SENSOR

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Abstract

The Alice Pixel Detector (ALPIDE) is developed for the upgrade of the Inner Tracking System of the ALICE experiment at CERN, which will take place during second Long Shutdown in 2019-2020. ALPIDE is a Monolithic Active Pixel Sensor (MAPS), manufactured in a 180 nm CMOS Imaging Process of TowerJazz. Forecoming tracking detectors, based on this technology, will see strong advantages with the application of these sensors as they provide the highest capabilities in spatial resolution and utmost potential for being thin. In this work, the results of the ALPIDE sensor beam test, which took place at the Beam Test Facility of Laboratori Nazionali di Frascati, are presented.

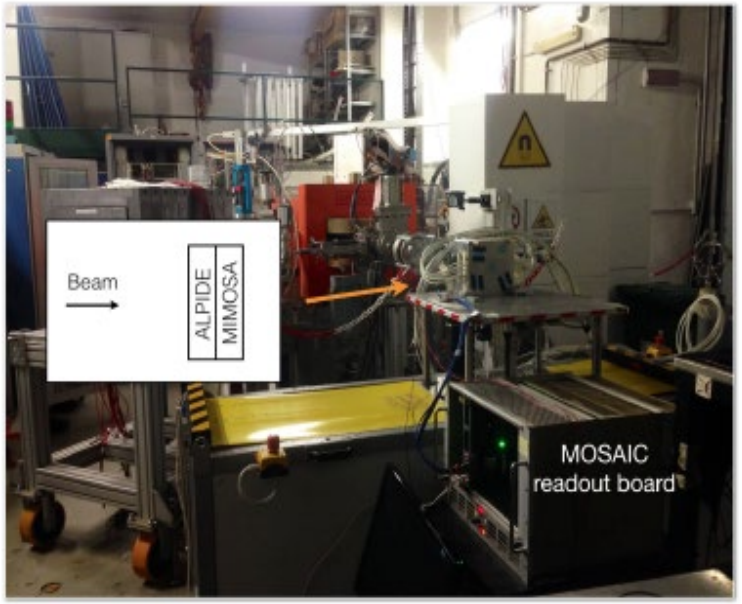


Figure 2: General view of the test setup assembled in the BTF hall.

BEAM test results for ITS2

e-/e+ @450 Mev 50 Hz

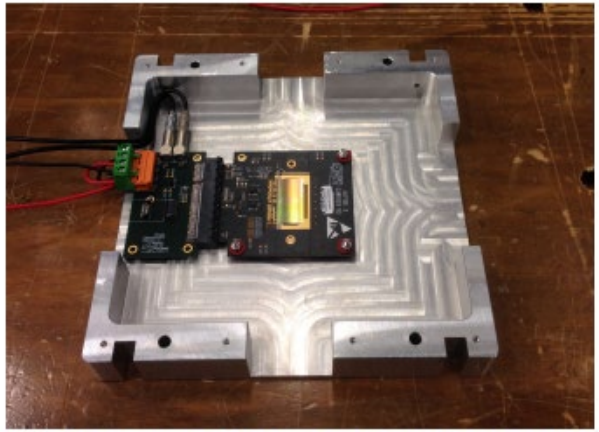
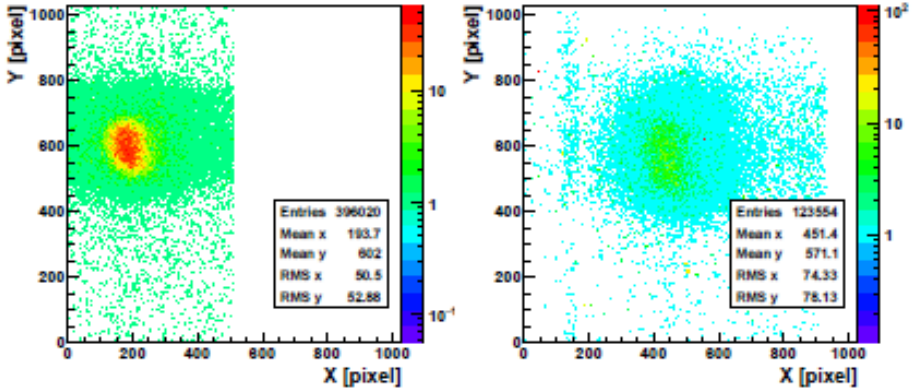
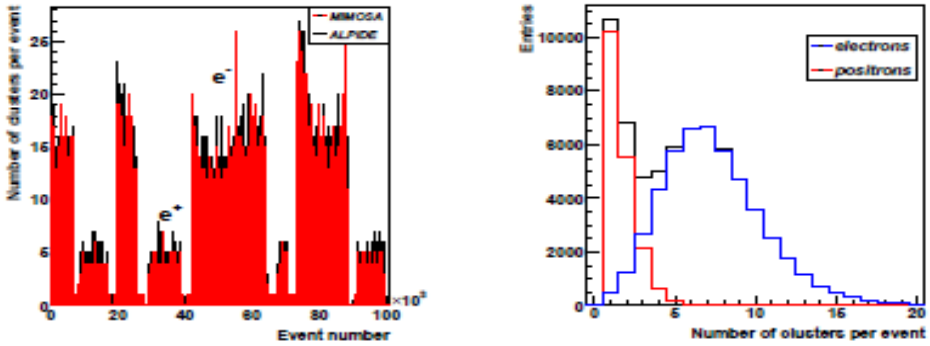


Figure 3: Carrier board with the ALPIDE sensor mounted on the supporting aluminur frame.



(a) ALPIDE (b) M28

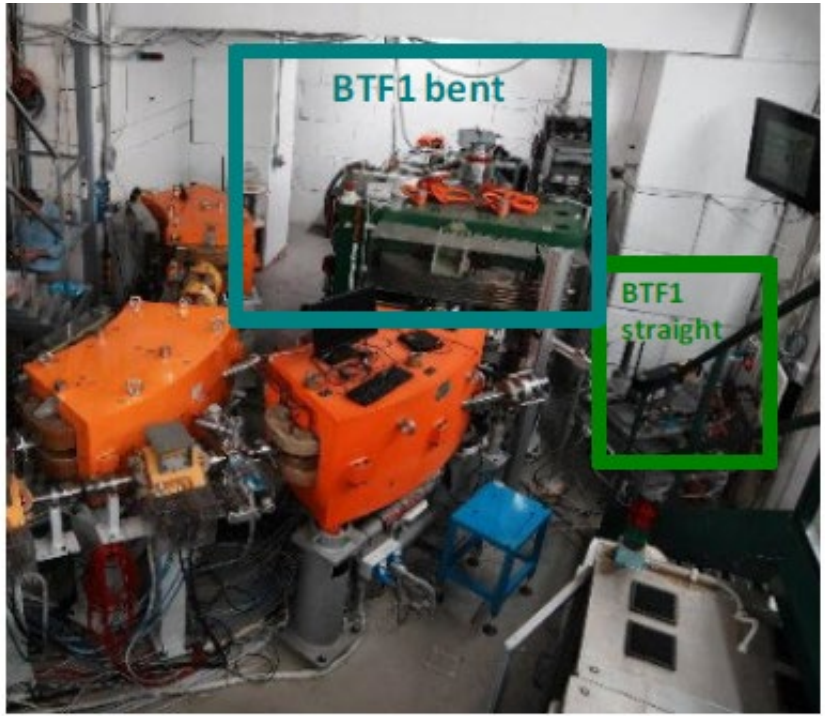
Figure 4: Distribution of the clusters' center of gravity in X-Y for ALPIDE (a) and M28 (b) sensors



(a) (b)

Figure 5: (a): Distributions of the number of clusters per event versus the event number for both the sensors. (b): Distribution of the number of clusters per event for ALPIDE.

BTF1: currently occupied by PADME



BTF2 :experimental area equipped with remote controllable table & beam diagnostic

BTF2 Beam diagnostics

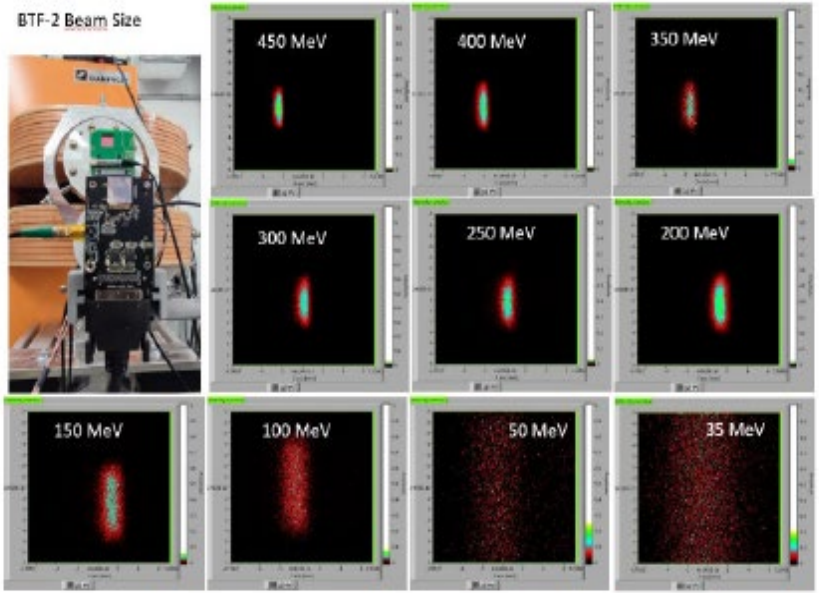


Figure 19 BTF2 secondary beam size for different energy mesured by a silicon pixel detector.

@ 450 Mev 1m σ=500μm

BTF2 : Beam diagnostics

@ 450 Mev individual electron peak 1..n

Timing / requests to the laboratories

- September, activities on the BTF are expected to resume after the LINAC shutdown.
- The call will open in September for allocation by the end of the year.
- Possibility to use BTF1 after the completion of PADME (by the end of the year?).
- Need to assess whether the tests to be conducted are compatible with BTF2 specifications.
- A dedicated person is required as an interface with the BTF, to be requested @ LNF.

Assembly in ALICE dedicated clean room

-A clean room has been operational, dedicated to ALICE from 2015 to 2019.

-A numerically controlled machine was purchased by ALICE.

-Technicians are already trained.

-It is necessary to define items and timing to submit requests to LNF.