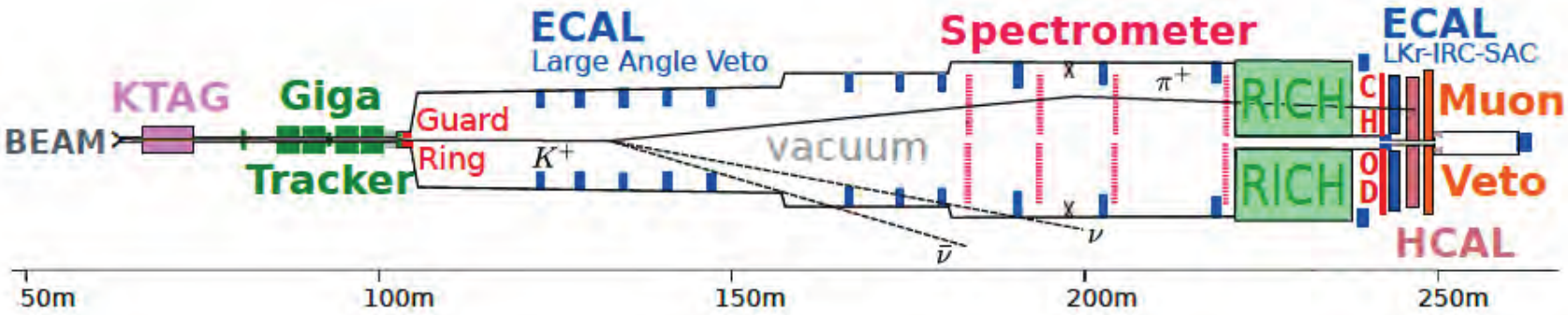
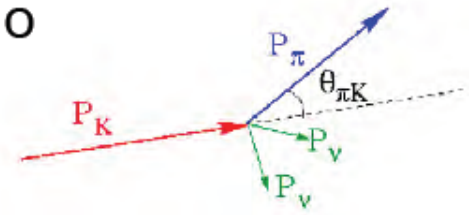
L'esperimento NA62

- Esperimento a bersaglio fisso
- Decadimento i volo dei K
- Misurare O(100) eventi ➡ 10^{13} decadimenti di K!!!



Fascio secondario

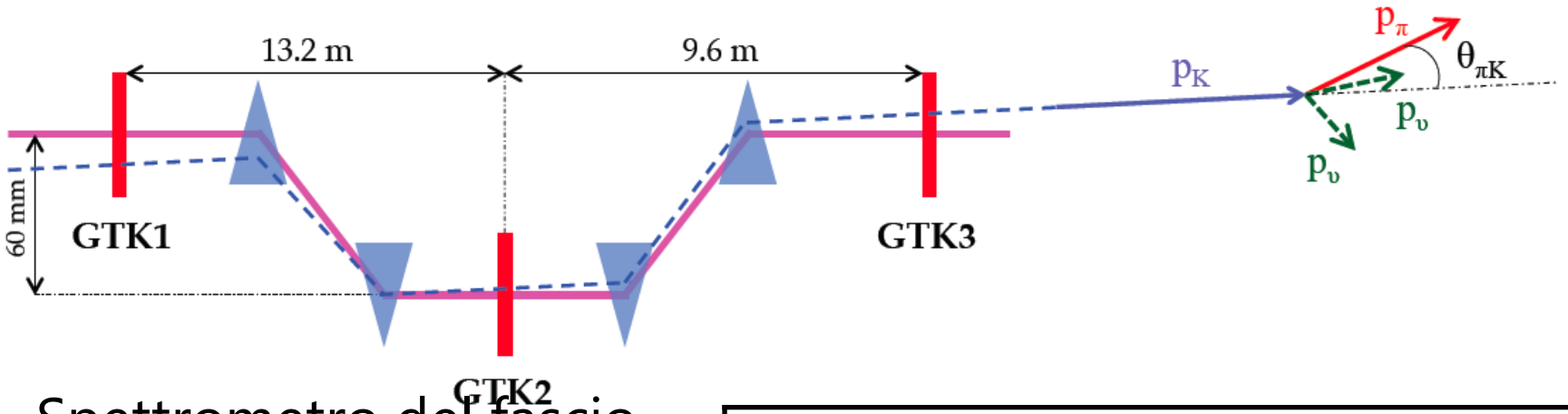
- 75 GeV/c
- 6% di K
- Rate: 0.75 GHz
- Dimensione: ~(6 x 3) cm^2



Strategia sperimentale

- ricostruzione cinematica precisa
- identificazione particelle: fascio e prodotti
- veto ermetico
- Precisione temporale sotto il ns

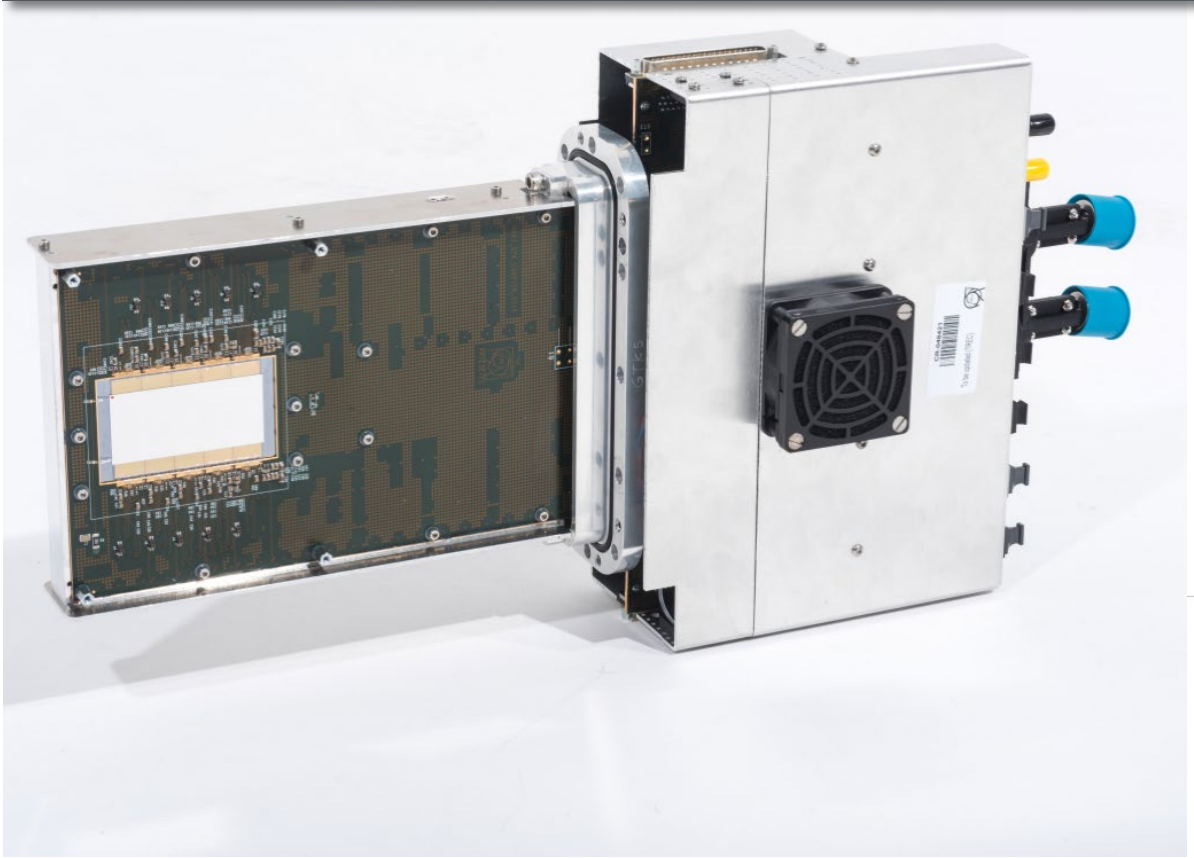
Il rivelatore GigaTracker

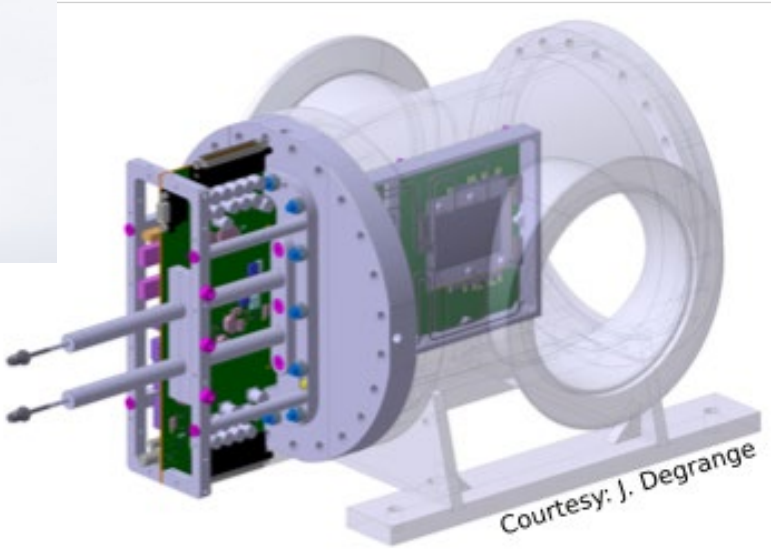


- Spettrometro del fascio
  - 3 stazioni: rivelatore ibrido a pixel
- Misura precisa delle particelle del fascio
  - tempo di passaggio
  - quantità di moto
  - direzione

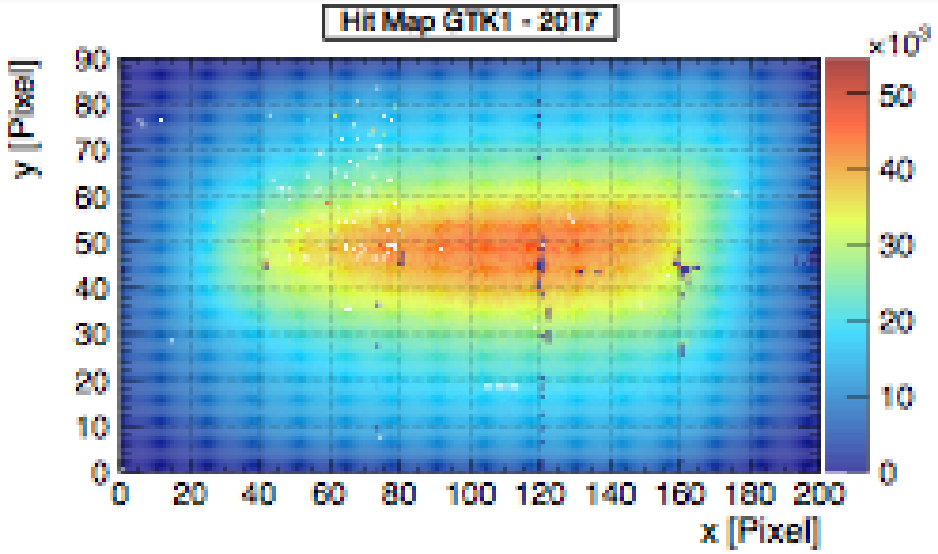
Beam rate	800 MHz - 1 GHz 1.3 MHz/mm^2
Radiation	10^{14} 1MeV eq n/cm^2/y
Efficiency	99%
Momentum resolution	0.2%
Angular resolution	16 μrad
Hit time resolution	<200ps RMS
Material Budget	3 × 0.5%X_0
Detector size	60mm × 27mm

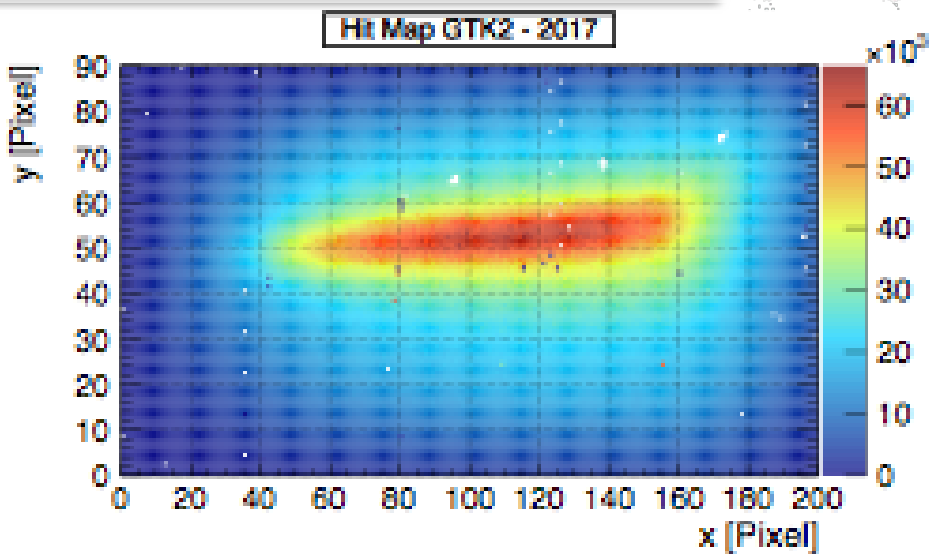
GTK: sensore

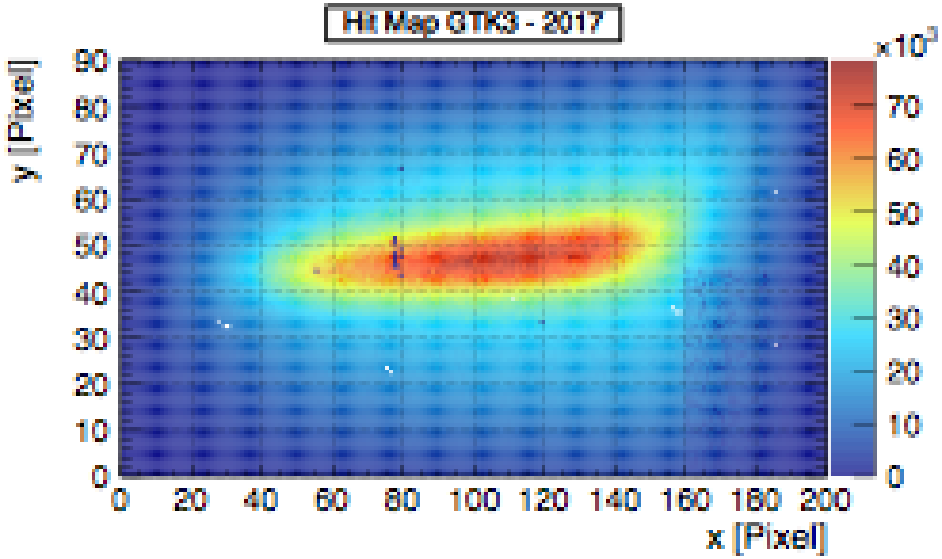


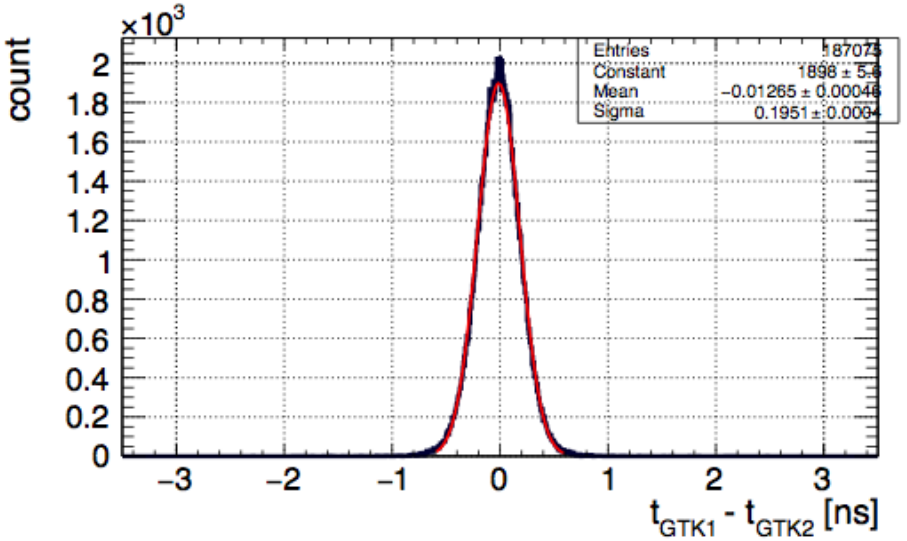


GTK:risultati







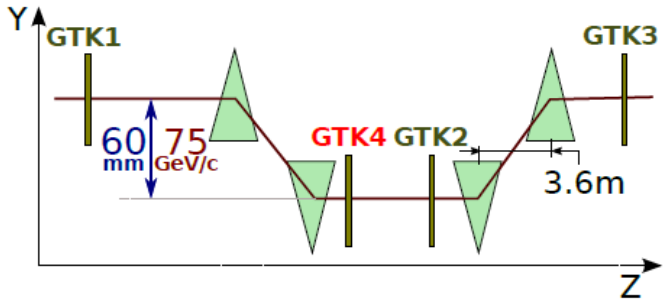


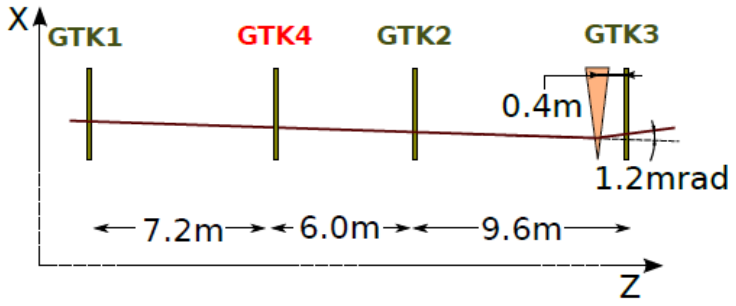
2018

GTK-4

Where?

Niels already made the beatch file: k12hika+G, dated 29/08/18





A 4th station would

- improve the tracking efficiency
- allow some proper pattern recognition to reduce fake tracks
- improve time resolution
- improve momentum and angular resolutions

2018

GTK-4

- **SE** decidiamo di farla non ci sono grossi ostacoli tecnici:
- L'installazione di una stazione supplementare richiede:
  a) Modifica della linea di fascio (gruppo CERN).
  b) Vessel (Louvain).
  c) Aggiunta di un loop al cooling plant (IT) e modifica software (gruppo CERN).
  d) Installazione fibre ottiche (ditta esterna).
  e) 10 schede GTK-Readout (Ferrara).
  f) Crate per il GTK-Readout.
  g) 2 PC supplementari per il DAQ-GTK.

- Sharing costi 45/45/10 IT/CERN/UCL as usual
- **Richiesta adesso parte di readout su FE per rischio obsolescenza FPGA**.
- Costo delle sole FPGA (ad oggi) circa 30k
- Decisione su GTK-4 entro Aprile: sblocco SJ o immediata disponibilità a CSN1

2019

Cost evaluation – only for the R/O

We don't want to reset to zero the setup of Bldg. 13, otherwise the tests on new chips should come back to the single chip, and not to a whole station of 10 chips.

We are then asking:

•15 complete cards (MB+DB), comprising 5 spares for the whole system GTK of 40 cards (now we have 3 spares for 30 cards)

•1 optical splitter 4-fold

•2 DAQ PCs

		€	**tot €**
15	Main Boards (PCB + passive components + assembly, according to the order 2015)	1830	27450
15	FPGA (short survey on the web: 3600$/item, scaled due to CERN survey)	1900	28500
15	other components	400	6000
15	Daughter cards (PCB+ passive components + assembly)	250	3750
4	4-fold splitter	250	1000
2	DAQ PC	4000	8000
	TOT		74700

procurement ended mid-September, more than 20 k€ saved.

2020

10 Marzo – consegnate 16 schede x2 (Mother +Daughter)
4 - 20 Maggio – controllo a Ferrara da Stefano Chiozzi: OK
8 Giugno – consegnate al CERN

seconda metà di Agosto: installazione GTK4 e test fw R/O
(Alberto Gianoli e Angelo Cotta Ramusino)