

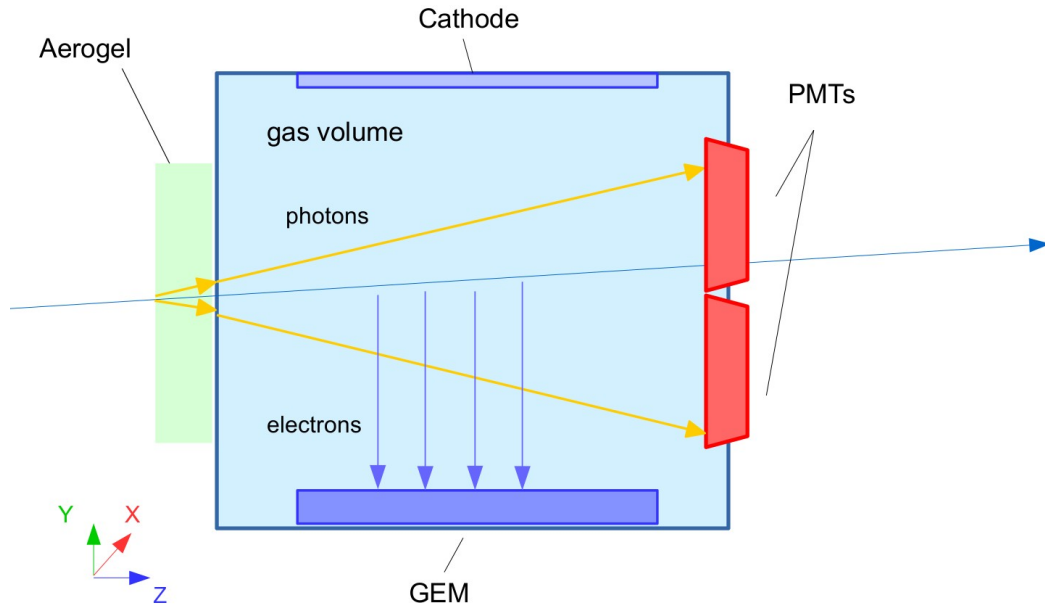


a **T**racking **R**ing **I**maging **C**heren**K**ov detector

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Sezioni Partecipanti: Ferrara, Torino

TRICK concept



5D reconstruction of charged hadrons in the momentum range up to 5 GeV/c

- 3D spatial reconstruction: $\sigma_x \sim 100 \mu\text{m}$
- time reconstruction (from RICH): $\sigma_t \sim 700 \text{ ps}$
- particle ID: π/K separation above 3σ

TPC

RICH

TRICK box design:

- 15 cm drift gap triple-GEM

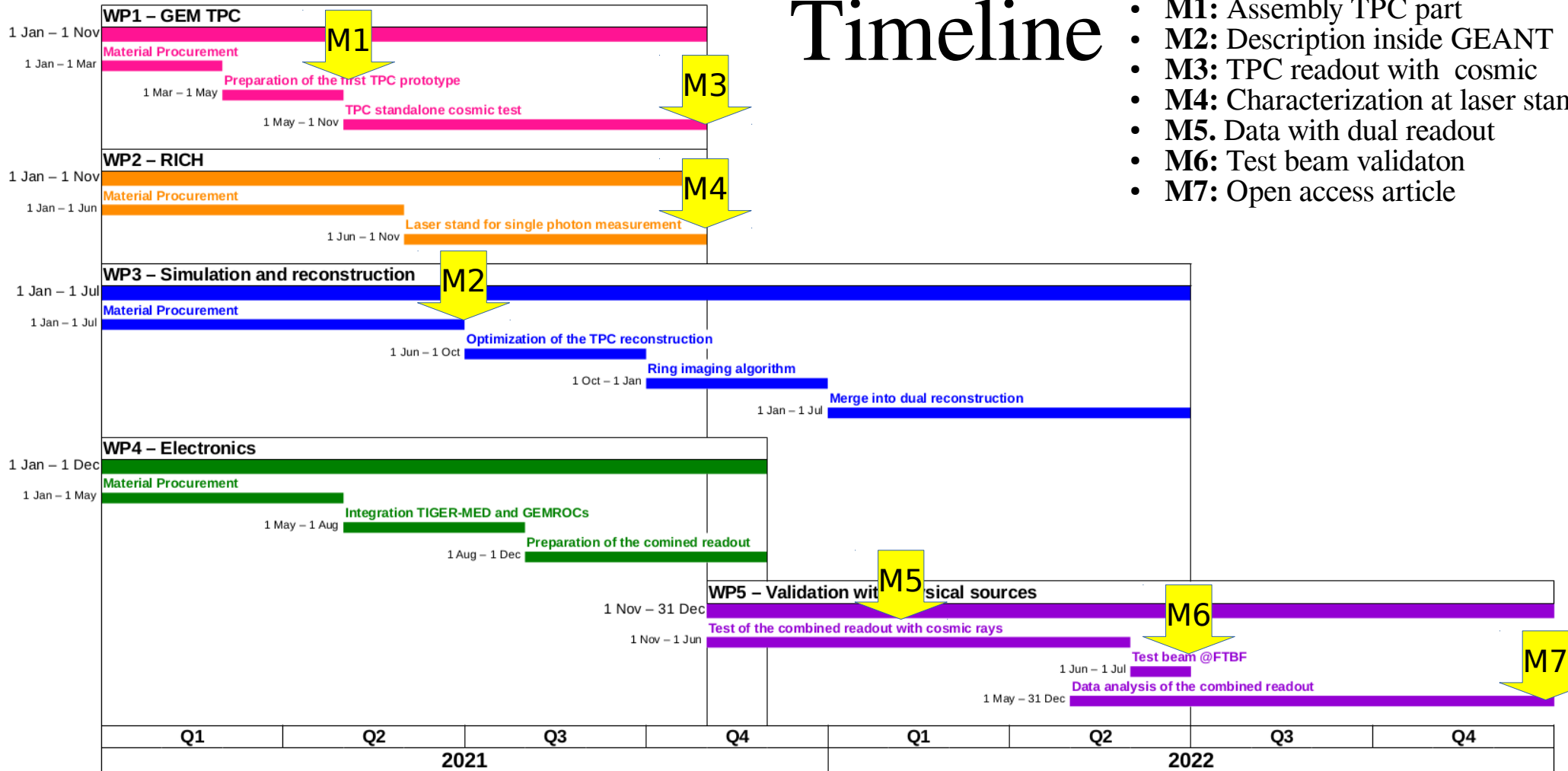
- Aerogel

- H8500C Hamamatsu MA-PMT

TRICK

Timeline

- **M1:** Assembly TPC part
- **M2:** Description inside GEANT
- **M3:** TPC readout with cosmic
- **M4:** Characterization at laser stand
- **M5:** Data with dual readout
- **M6:** Test beam validation
- **M7:** Open access article



Budget

Item	quantity	unitary cost	total cost	WP
Consumables				
Lab consumables	1	4	4	1,2
prototype mechanics	1	3	3	1,2
gas	4	0.5	2	1,2
TIGER-GEM boards	10	0.5	5	4
H8500c MA-PMTs	4	5	20	2
transition boards	4	0.5	2	1,2
TIGER-MED boards	6	0.5	3	4
GEMROCs	4	3	12	4
Aerogel	1	3	3	2
Inventory				
SMC chiller	1	5	5	1,2,4,5
HV board	1	5	5	1
Travels				
Development weeks			8	
Total first year			72	

Item	quantity	unitary cost	total cost	WP
Consumables				
Lab mechanics	1	4	4	1,2
Test beam mechanics	1	5	5	5
Test beam shipping	2	2	4	5
gas	4	0.5	2	1,2
Inventory material				
GEM trackers	2	3	6	5
PC DAQ	1	2	2	3,5
Travels				
Test beam travel	6	2.5	15	5
other travels	1	4	4	
conference	1	2	2	
open source publication	1	2.5	2.5	
Total second year			46.5	

Per il primo anno, richiesta assegnazione a INFN-TO:

- 5+3 k€ per TIGER-GEM/TIGER-MED boards
- 4 k€ viaggi
- 1 k€ materiale di consumo di laboratorio

Richieste per il primo anno
 INFN-FE: 59 k€
 INFN-TO: 13 k€

Referee e Budget approvato

Nomi referee:

- Marzio De Napoli (Catania) – Detector – JLAB12
 - Andrea Fabbri (Roma3) – Elettronica
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INFN-TO – 11 kE:

- 2 kE di trasferte
- 8 kE di TIGER board (TIGER-GEM + TIGER-MED)
- 1 kE di consumabili (RS per minuteria elettronica)

INFN-FE – 48 kE:

- 2 kE di trasferte
- 16 kE per 5 MA-PMT
- 5 kE per Chiller
- 5 kE per HV-Board
- 3 kE per Aerogel
- 9 kE per GEMROC (3 pz)
- 8 kE di consumabili (gas, minuteria, meccanica prototipo)

Milestone

- WP1 (TPC): realizzazione meccanica prototipo
- WP2 e WP4 (RICH e Elettronica): Test lettura MA-PMT con TIGER-MED
- WP3 - realizzazione framework software per studi di ottimizzazione TPC e RICH con descrizione della geometria in G4 e Garfield

In 7-8 mesi