

Cosmic and beam-halo tracker (with RPCs)

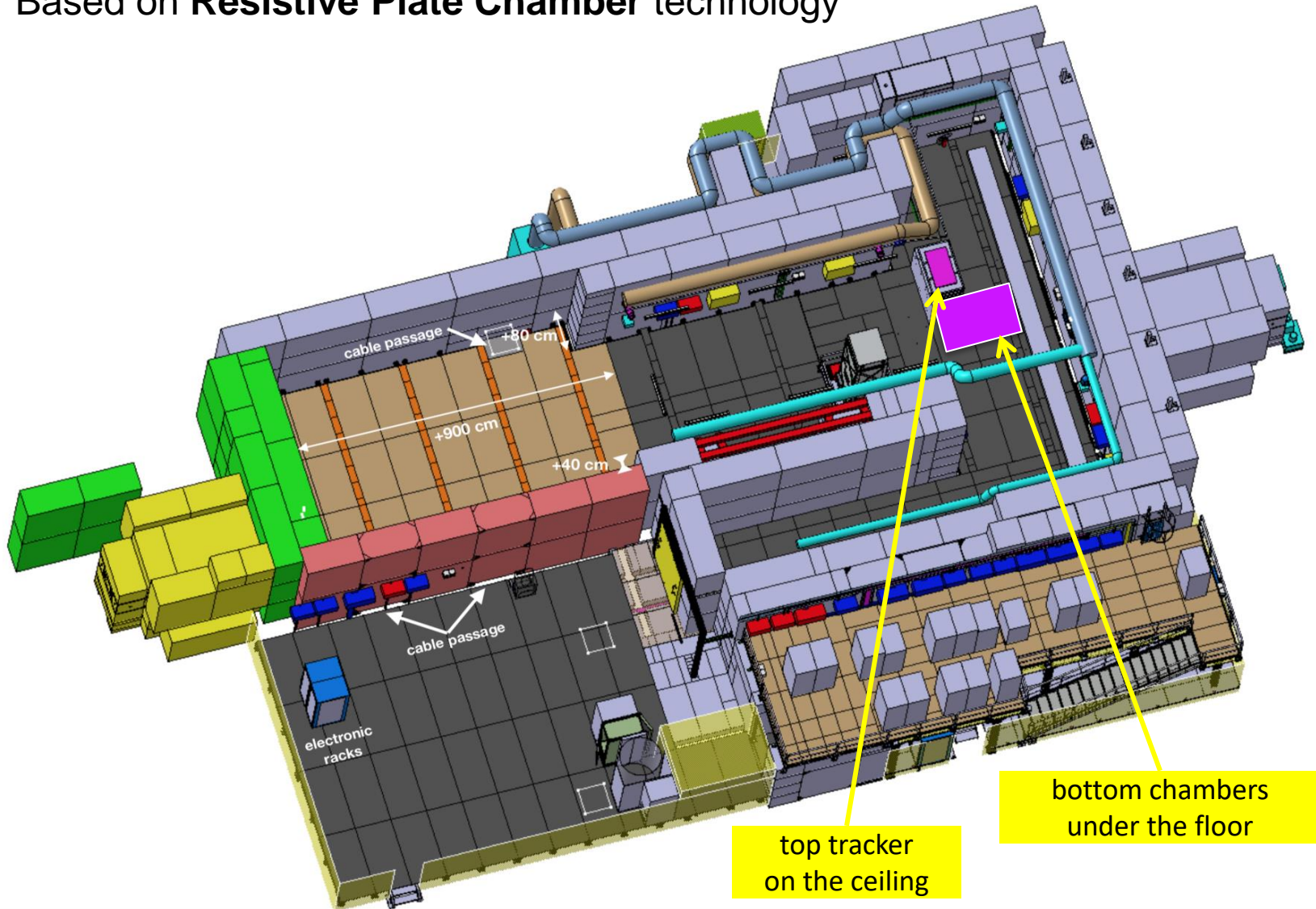
D.Boscherini (INFN-Bologna)



GIF++ User Annual Meeting - CERN, 03/12/2024

Cosmic tracker: setup

Based on **Resistive Plate Chamber** technology

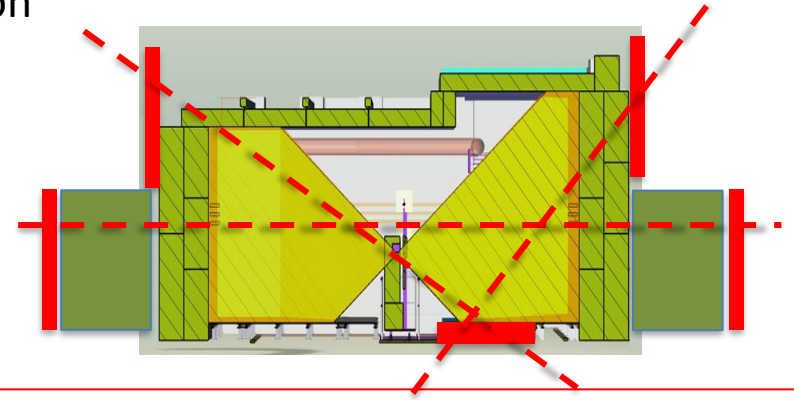


Extension of cosmic-ray tracker

First tracker coverage limited to downstream region

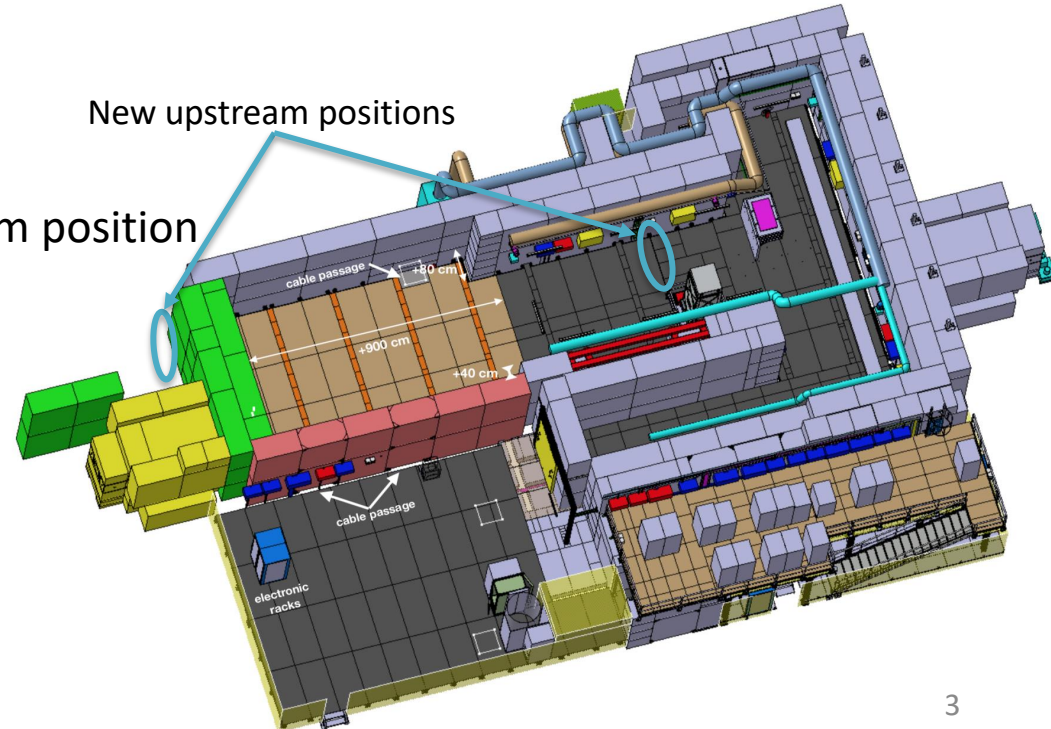
Proposed extension via installation of 4 RPC chambers vertically on the bunker endcap walls

- Extended coverage
- Selection of harder momentum muons
- Triggering on beam-halo muons



Downstream chamber position **ok**

Current proposal for chamber upstream position
(modified with bunker extension)



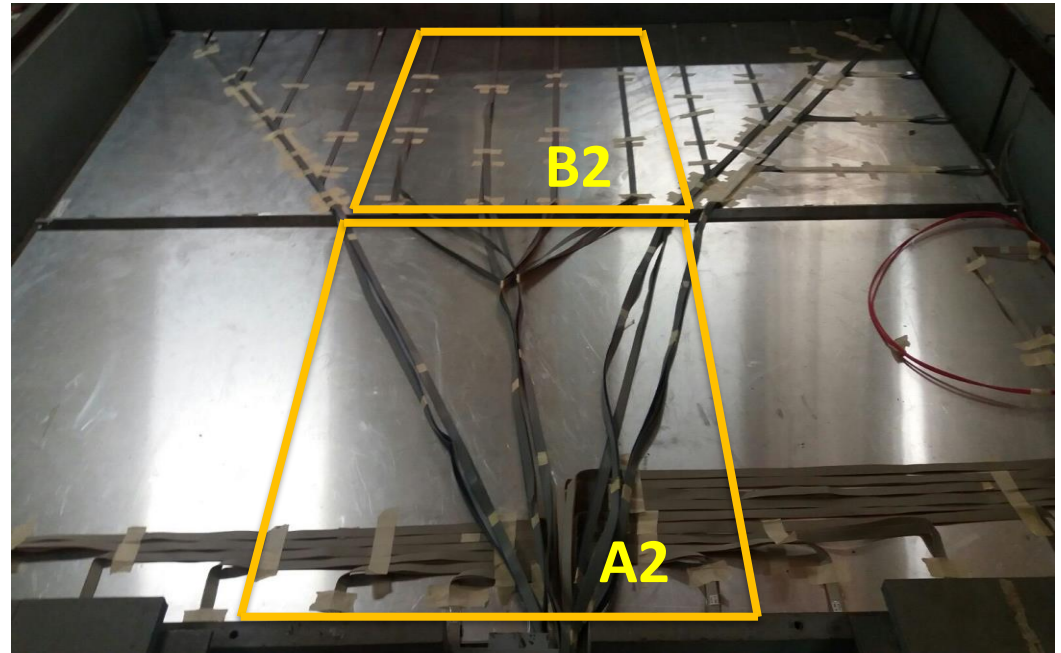
Cosmic tracker: bottom chambers

Bottom chambers in place since years

High gap currents observed

Gas flow checked: ok

Further investigation needed

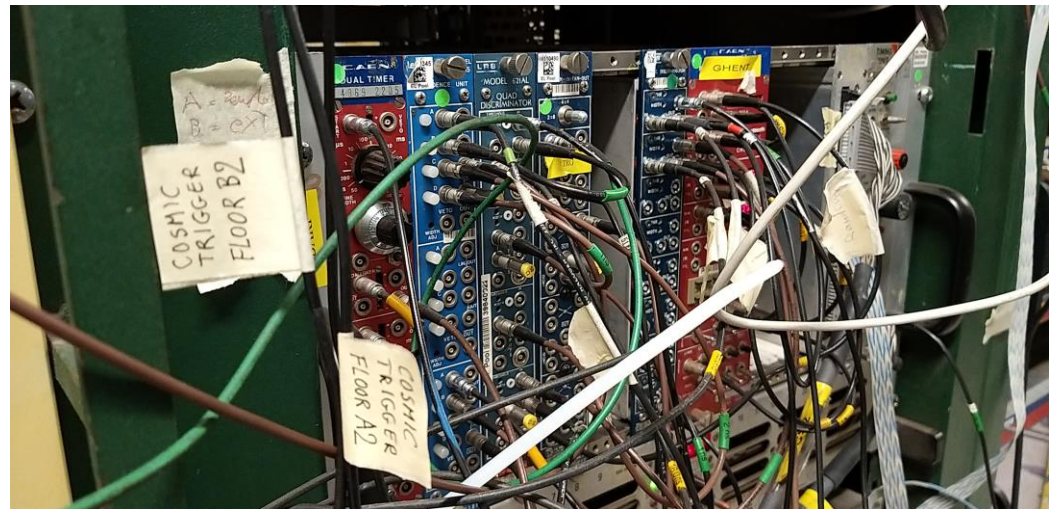


NIM crate with coincidence logic
between the two chamber layers

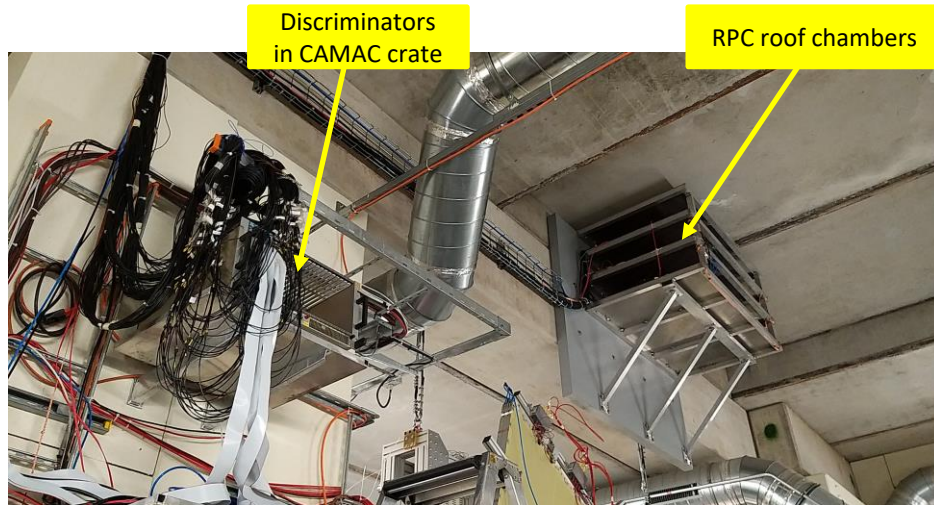
→ 2 LEMO cables

Two trigger signals available
from central part of the chambers

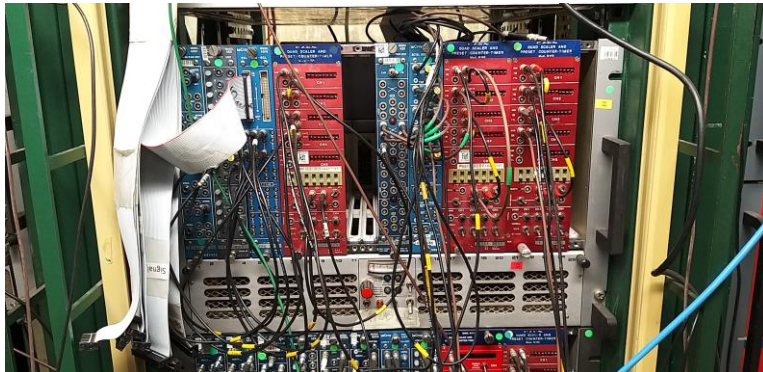
Need additional crates with NIM modules
to provide trigger from entire chambers



Cosmic tracker: top chambers



Signals from RPC chambers discriminated in a crate inside the bunker



Electronics outside the bunker where the trigger logics is being implemented

RPC chambers for tracker extension

Chamber status

- 4 chambers in Rome2
- all gas volumes (16) with internal surface re-oiled at General Tecnica since last year
- activity delayed by heavy renovation works of the lab
- table for chamber re-assembling available again

Cosmic tracker: to do list

Bottom chambers

- verify gas-volume functionality
- complete electronics for trigger coverage when needed

Top chambers

- check chamber signals in the service area
- setup electronics implementing the trigger logic

External chambers

- define position of upstream chambers
- complete chamber refurbishment
- plan shipping to CERN