COMPASS

NA58 experiment at CERN SPS

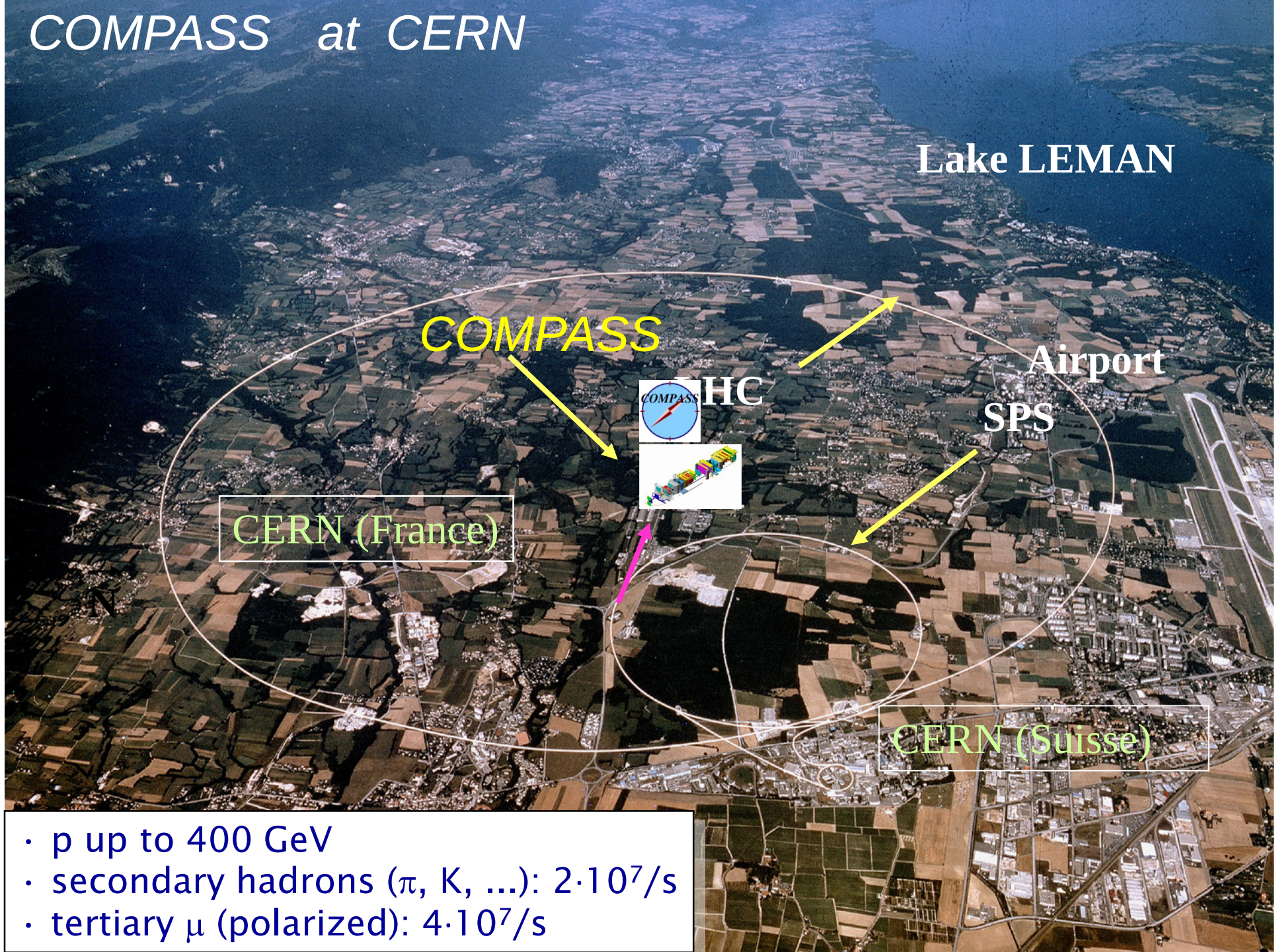
COmmon
Muon and
Proton
Apparatus for
Structure and
Spectroscopy

20 Institutes/11 counties/~230 physicists

Czech Republic, Finland, France, Germany, India, Israel, Italy, Japan, Poland, Portugal and Russia

Bielefeld, Bochum, Bonn, Burdwan/Calcutta, CERN, Dubna, Erlangen, Freiburg, Lisbon, Mainz, Moscow, Munich, Prage, Protvino, Saclay, Tel Aviv, Torino, Trieste, Warsaw and Yamagata

COMPASS at CERN



- p up to 400 GeV
- secondary hadrons (π, K, ...): $2 \cdot 10^7$/s
- tertiary μ (polarized): $4 \cdot 10^7$/s

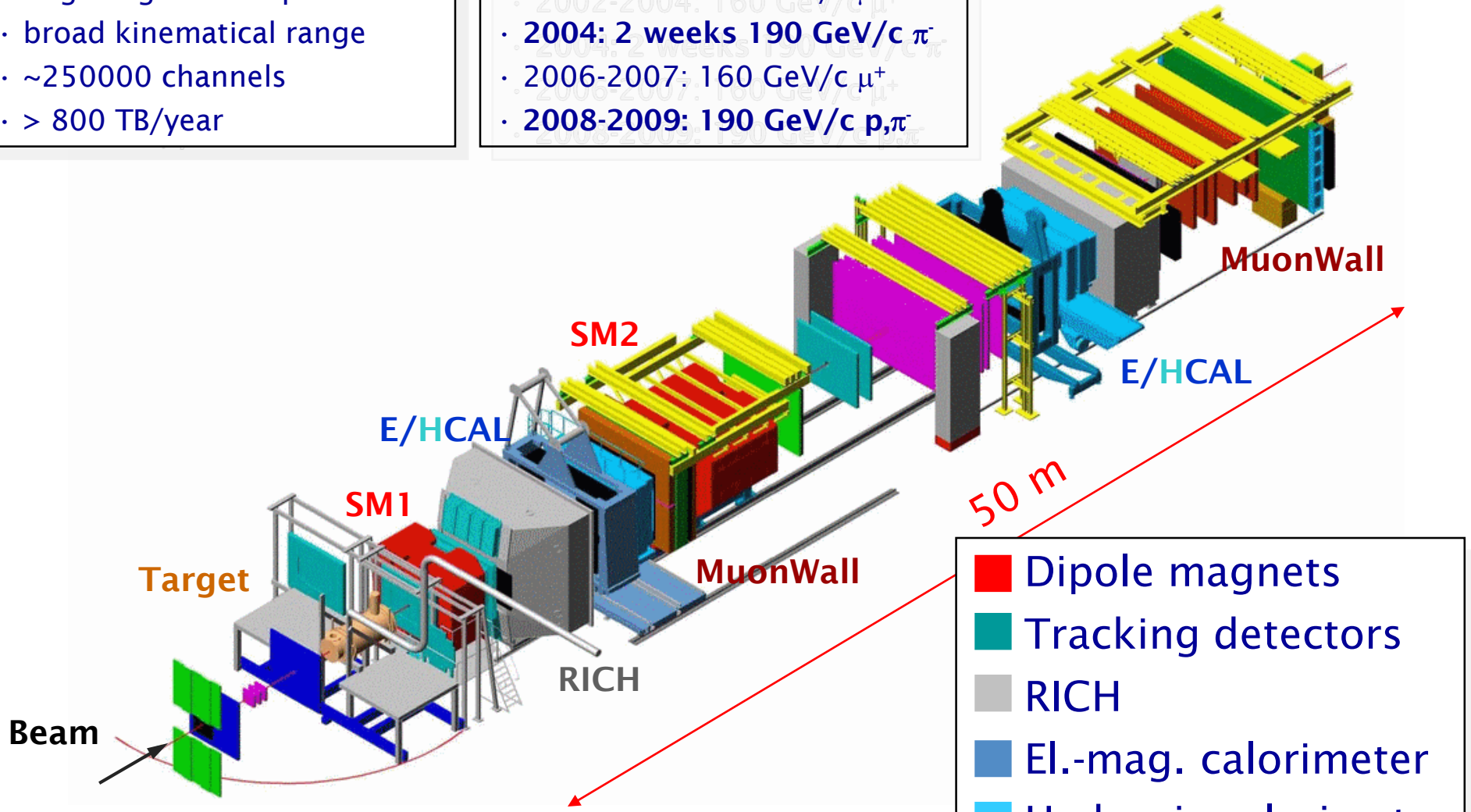
The COMPASS Experiment

Two-stage spectrometer

- large angular acceptance
- broad kinematical range
- ~250000 channels
- > 800 TB/year

Data taking periods:

- 2002-2004: 160 GeV/c μ^+
- **2004: 2 weeks 190 GeV/c π^-**
- 2006-2007: 160 GeV/c μ^+
- **2008-2009: 190 GeV/c p,π^-**

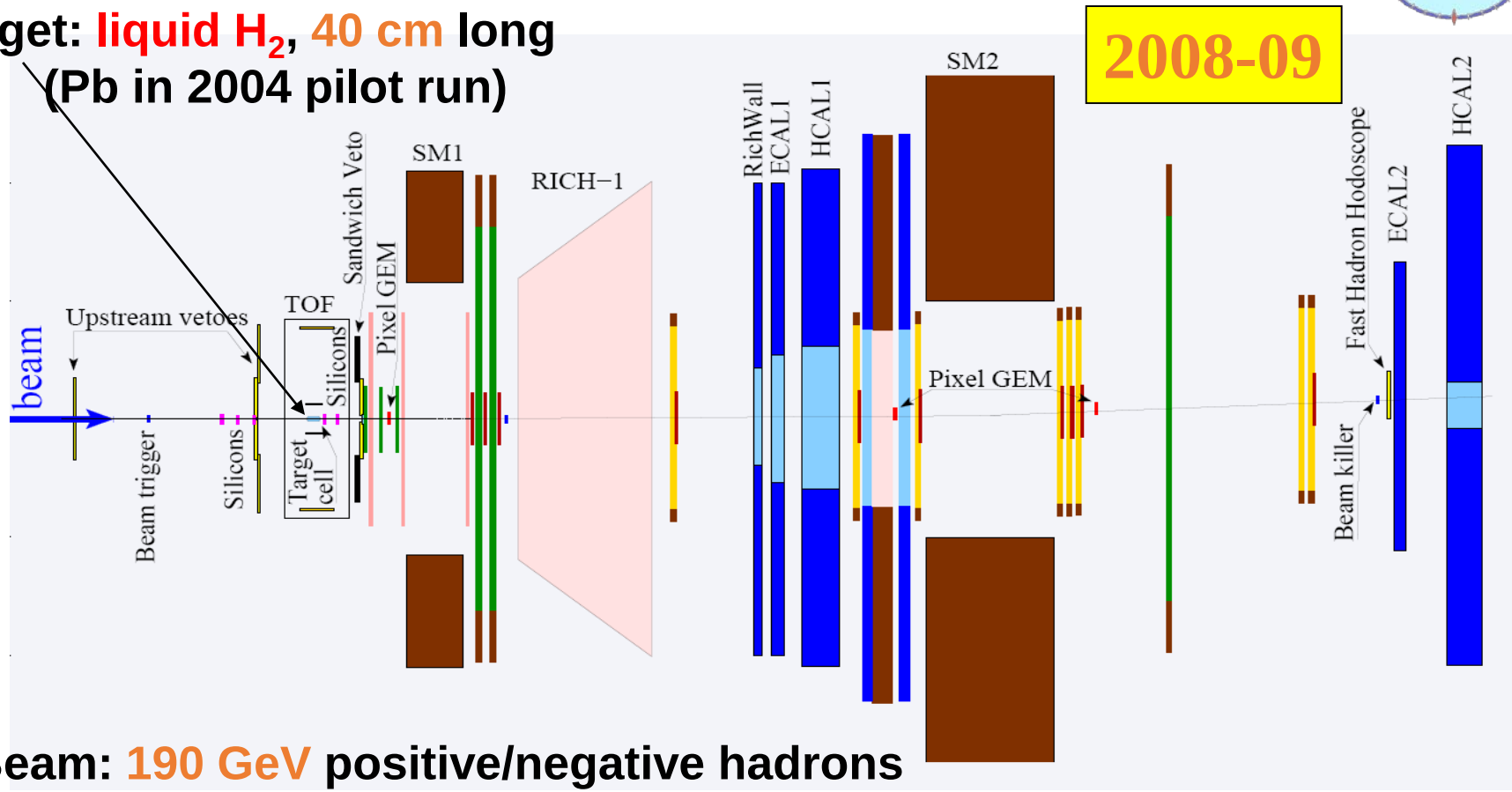


- Dipole magnets
- Tracking detectors
- RICH
- El.-mag. calorimeter
- Hadronic calorimeter
- Muon identification

[hep-ex/0703049, NIM A 577, 455 (2007)]

SETUP FOR HADRON PROGRAM

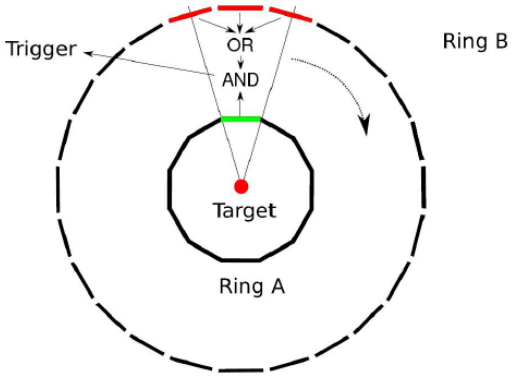
Target: liquid H_2, 40 cm long
(Pb in 2004 pilot run)

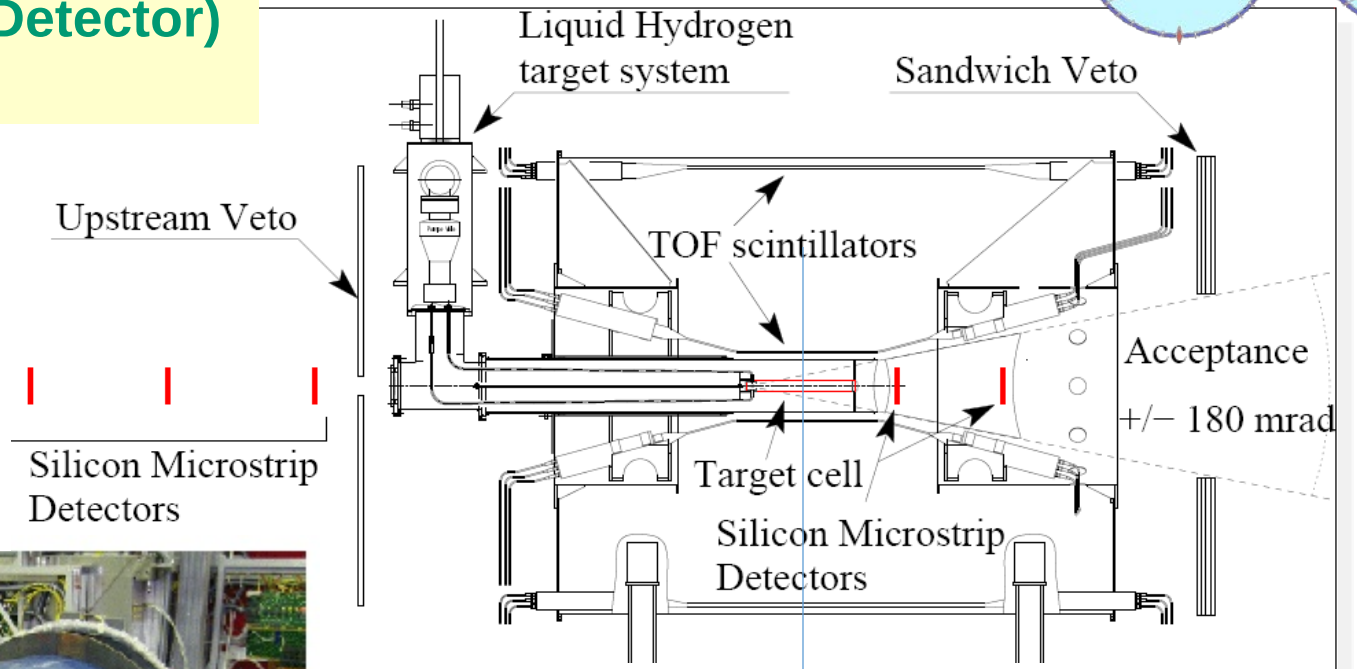


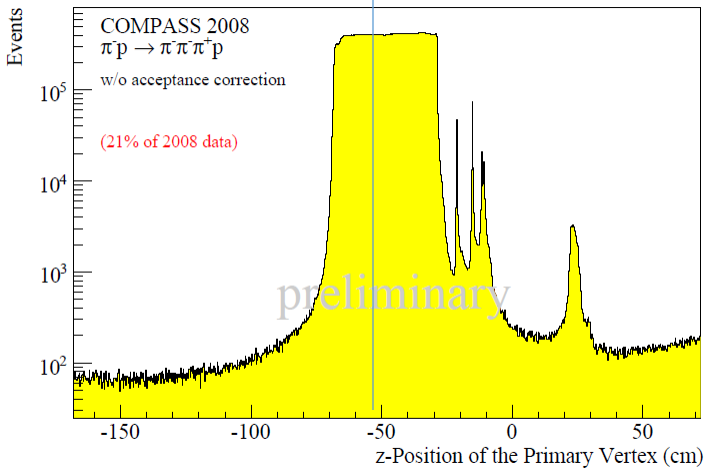
Beam: 190 GeV positive/negative hadrons
Negative: 96% π^-, 3.5% K^-, 0.5% p-bar
Positive: 75% p, 25% π^+, 5% K^+
Beam intensity: $2 \cdot 10^7$/s (10^8/spill, spill=4.8s, cycle=16.8s)
P-id by beam Cherenkov Counter (CEDAR)

TARGET PART IN HADRON PROGRAM

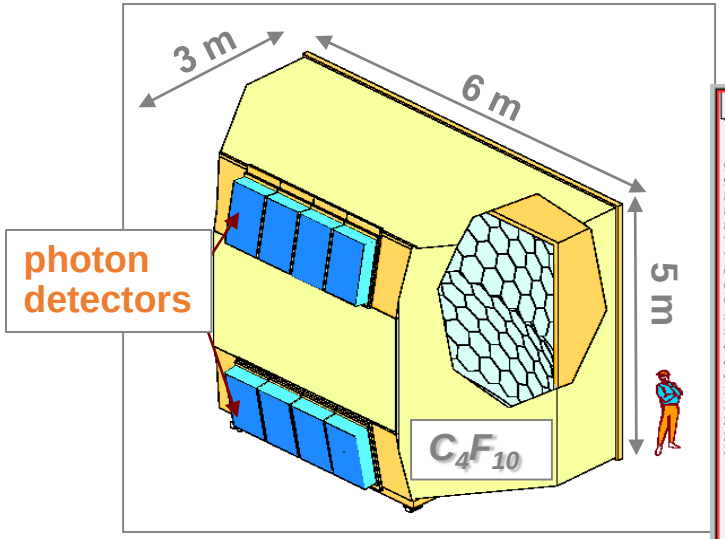
RPD(Recoil Proton Detector)
Installed in 2007

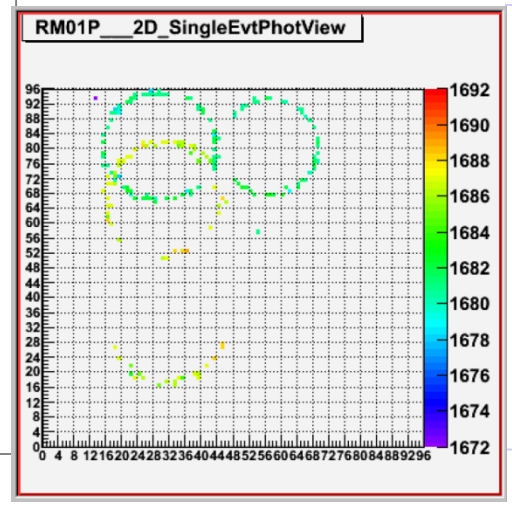


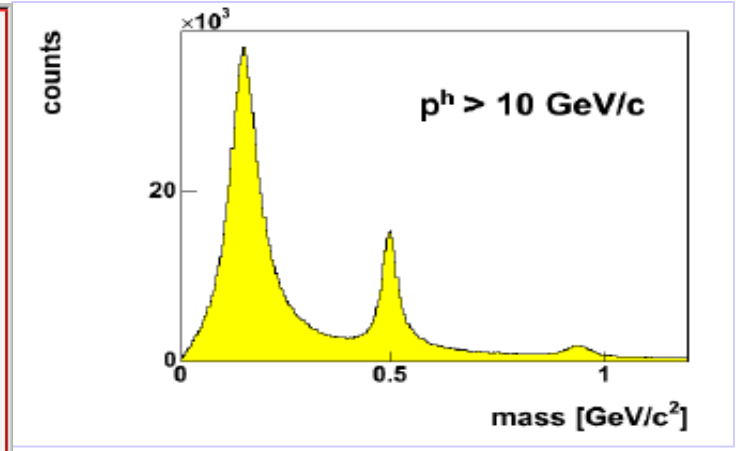


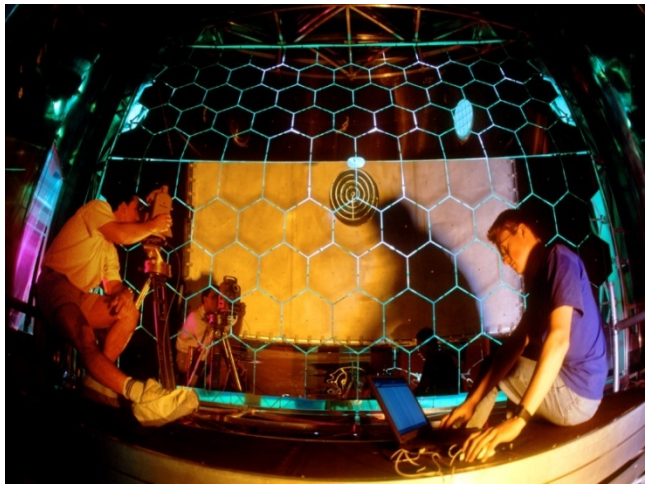


THE RICH DETECTOR









- radiator gas: C_4F_{10}
- mirror wall: 20 m^2 surface
- photon-detectors:
  - outer part (75%) MWPC(pad RO) with CsI cathode
  - inner part(25%) 576 MAPMTs with indiv. telescope

threshold momenta

- p_π = 2 GeV/c
- p_K = 9 GeV/c
- p_P =17 GeV/c

Installed in 2005,
Used in data taking from 2006

The Compass Spectrometer