

# Future of COMPASS experiment

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- Physics with muon beam
- Physics with hadron beam
- COMPASS setup
- Plans for next years

# Physics with hadron beams

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## Charmed hadrons studies:

- Charm hadroproduction
- Charmed hadrons decays (semi-leptonic decays, lifetime measurements)
- Double-Charmed Baryons

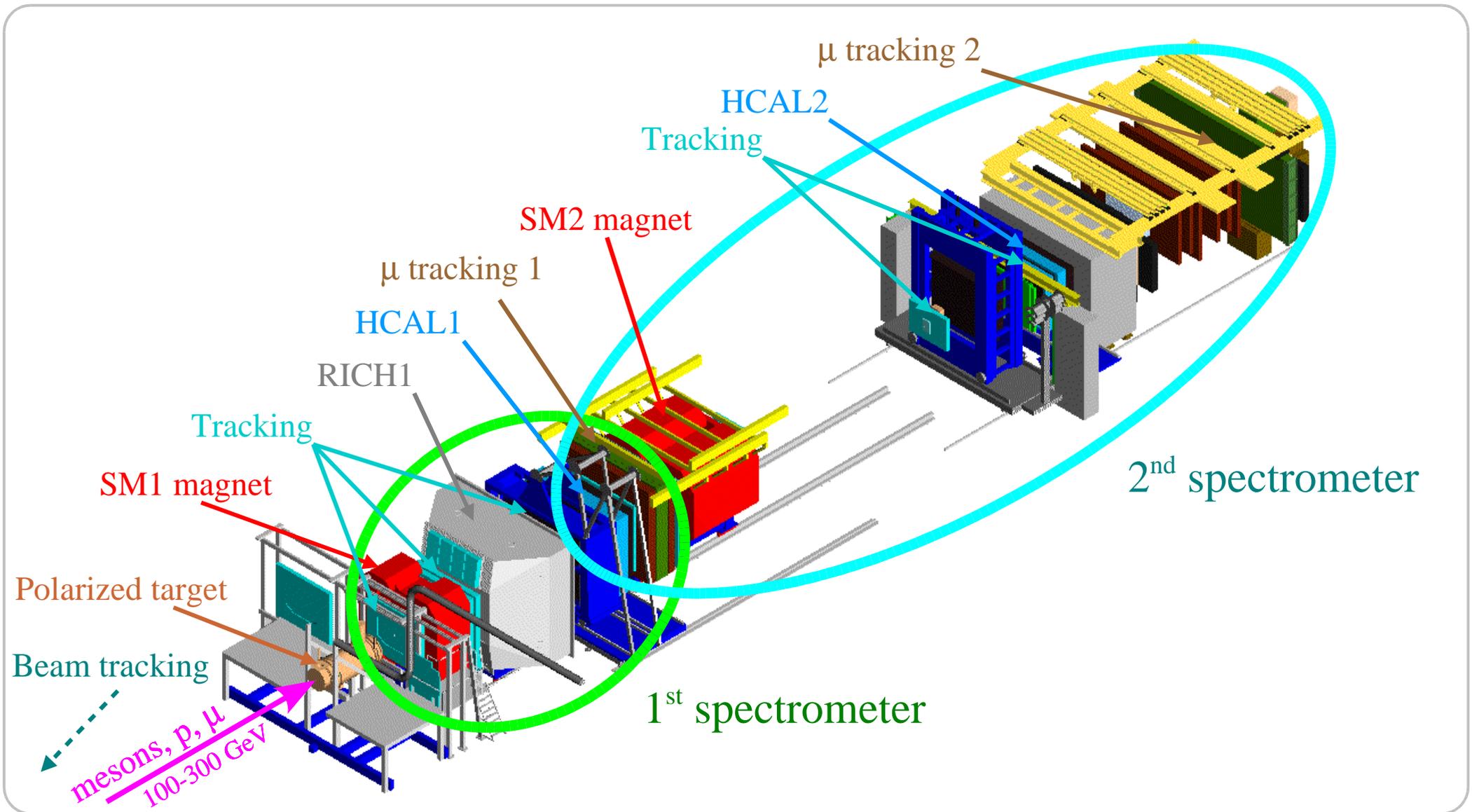
## Hadrons structure studies with Primakov reactions:

- $\text{hadron} + Z \rightarrow \text{hadron} + \gamma + Z$
- $\pi$ ,  $\Sigma$  and  $K$  polarizabilities and radiative transitions
- chiral anomaly tests

## Search for Gluonic Systems

## Charmed Exotics (search for tetraquarks and pentaquarks)

# The COMPASS spectrometers



# COMPASS in 2002

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- 160 GeV  $\mu$  beam with  $2 \cdot 10^8$   $\mu$  per spill of 5 seconds each
- Target of  ${}^6\text{Li-D}$  with up to 50% polarization (SMC magnet), flipped every 8 hours
- Data taking from 27<sup>th</sup> May to 18<sup>th</sup> September  
⇒ 60-80 days of full data taking including 10 days in transverse polarization mode
- Transversity data:
  - ~ 270 runs ⇒  $540 \cdot 10^6$  triggered events
  - ~ 30% proposals luminosity for deuteron target
- Longitudinal polarization data for  $\Delta G$ :
  - ~ 2000 runs ⇒  $4 \cdot 10^9$  triggered events
  - ~ 20% proposals luminosity

# COMPASS plans for 2003-2004

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## Spectrometers upgrades:

- Electromagnetic calorimeter ECAL1
- Electronics of electromagnetic calorimeter ECAL2
- Straws modules added on 1<sup>st</sup> spectrometer tracking
- New COMPASS target magnet foreseen in 2004 (180 mrad acceptance instead of 70)

## Foreseen data taking:

- 4 months (~100 days) data taking per year with  $\mu$  beam at 160 GeV
- Including 30 days/year in transverse polarization mode
- Target material  ${}^6\text{LiD}$  in 2003, to be decided in 2004

SPS will be stopped during 2005

# Tentative plans for 2006 and after

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## Data taking for hadron program:

- Primakov studies (20-30 days with proton beam and mixed mesons beam ( $\pi$ , K,  $\Sigma$ ))
- Charmed hadron physics (100 days with proton and mesons beam)
- Glueballs physics (2 years of 150 days each)

May continue muon program with full 2<sup>nd</sup> spectrometer

## Detectors upgrades:

- Completion of 2<sup>nd</sup> spectrometer with RICH2
- Hadron program targets (Pb, Cu, carbon, liquid H<sub>2</sub>)
- Silicon tracker behind target
- Tracking improvements
- Trigger improvements

# Conclusions on COMPASS future

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Real physics data taking has begun in 2002

Period before 2005 mainly devoted to  $\Delta G$  and transversity physics

Hadron program after 2005 (+ end of muon data taking ?)

Deep Virtual Compton Scattering investigated for late future

Workshop on COMPASS future 25-26<sup>th</sup> September at CERN