

The 2014/15 COMPASS Drell-Yan Changeover

DPG-Darmstadt 2016

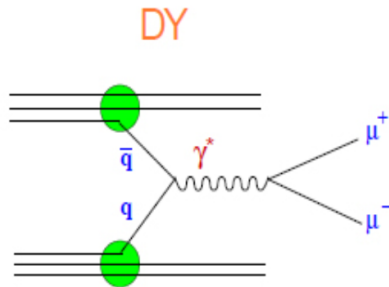
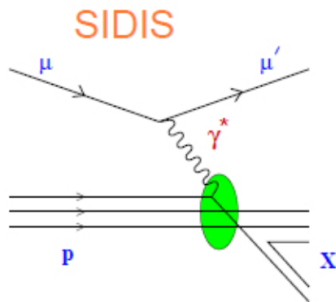
HK 54.1

Benjamin Moritz Veit

March 16, 2016



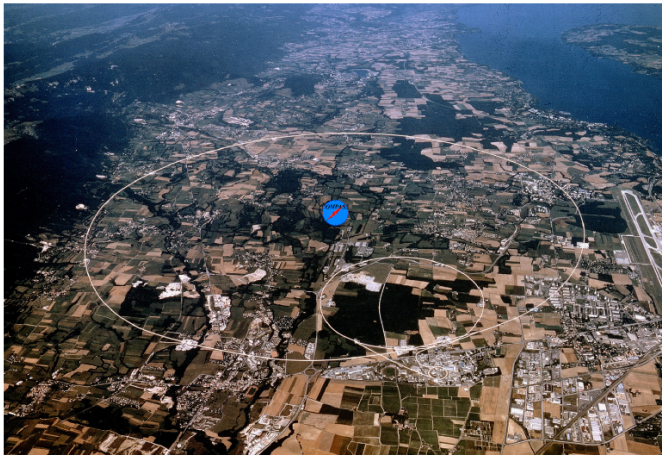
COMPASS Physics



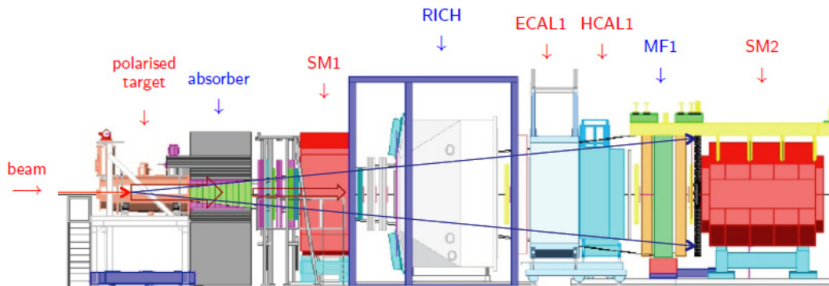
- SIDIS: inclusive measurement of scattered muon
- DY: measurement of angular distribution of dilepton pair
- DY and DIS are complementary processes
- Access to PDFs like the Sivers function through DIS or DY

The COMPASS Experiment

COmmon MUon Proton Apparatus for Structure and Spectroscopy

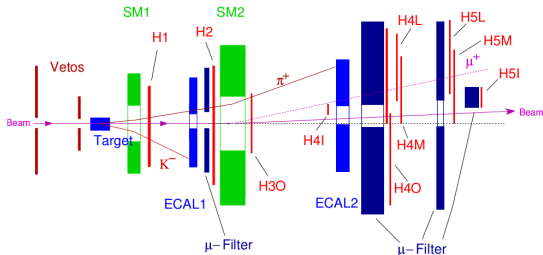


COMPASS DY Setup 2014/15



- Pion Beam on polarized NH_3 Target
- Large absorber behind the target (DY measurement)
- Two-stage forward spectrometer
- Muon trigger system

Trigger



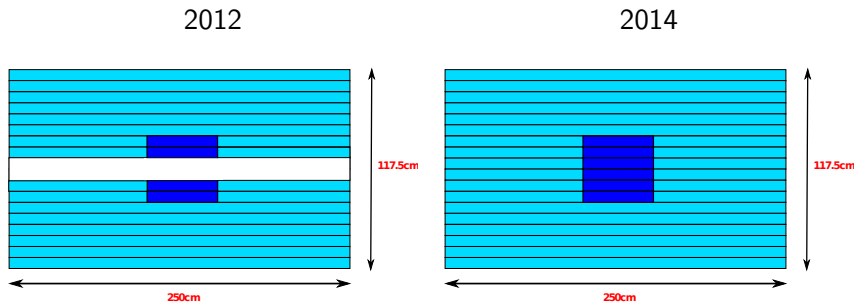
Two independent trigger systems:

- **Myon trigger** (Hodoscopes for Target Pointing)
- **Calorimeter trigger** (Energy threshold)

Modification of trigger for DY to get equal acceptance for μ^+ / μ^- :

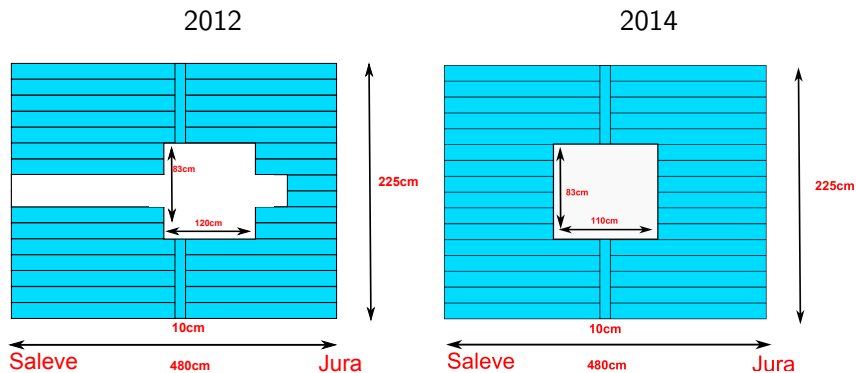
- Shift of Middle Trigger hodoscopes
- Modification of the Outer Trigger geometry

Modification of the Outer Trigger HO03



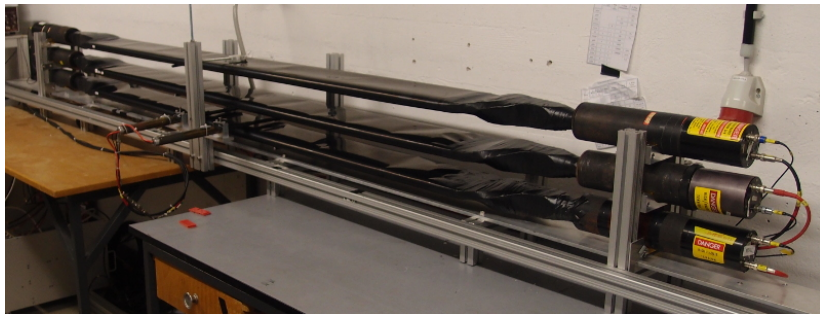
- Two new stripes for dimuon acceptance
- 2x105 cm BC408 active material
- Inactive central hole (40 cm acrylic glass)

Modification on Outer Trigger HO04



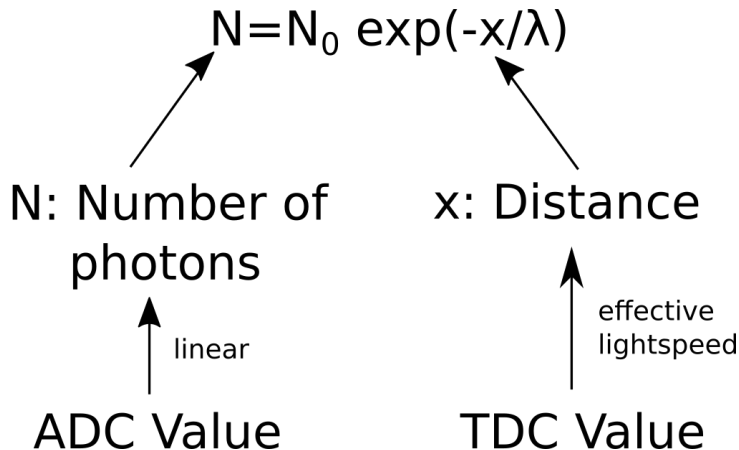
- Change of the hole region
→ Building 12 new slabs out of old scintillator material from NMC

Measurements on Testbench

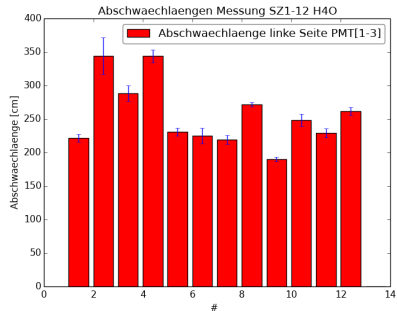
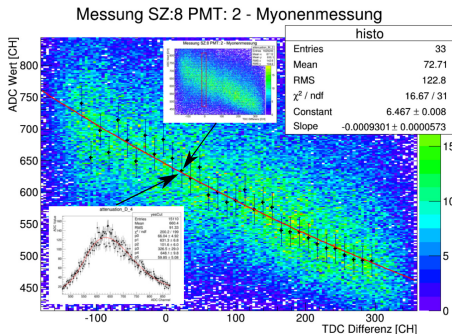


- Testbench for characterisation of three Scintillator at the same time with cosmic muons or radioactive source
- Different measurements possible: attenuation length, lightspeed in scintillator, time resolution

Attenuation Length Measurement

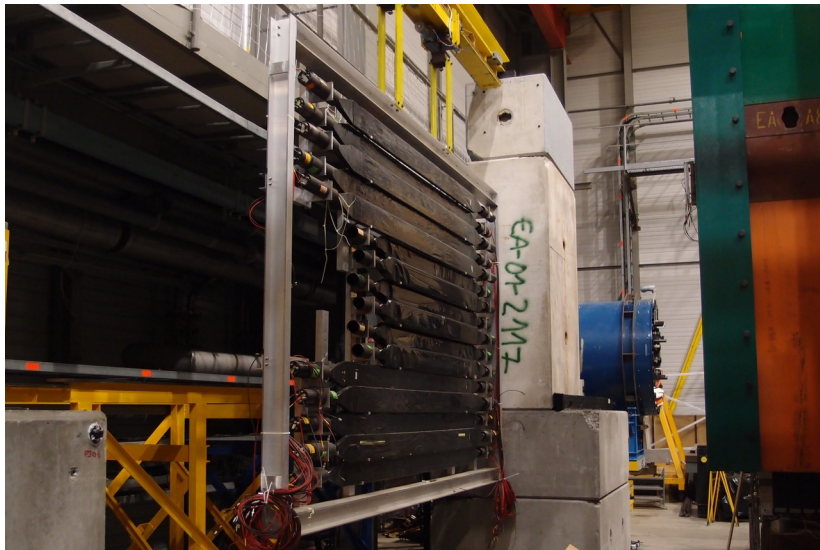


Attenuation Length



- Result: all attenuation lengths larger than scintillator length
→ Use of old material is possible

Installation 2014



Hodoscope Efficiency

Data:

- Reconstructed data of special trigger runs with pion beam

Data selection:

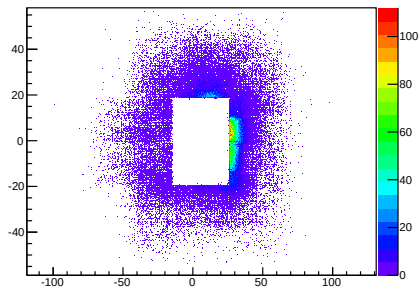
- Pure Calo Trigger events
- Best primary vertex in Target
- Identification of Muon
- $Q^2 > 0.1$

Hodoscope Efficiency:

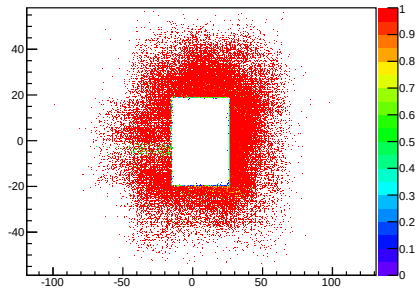
$$\epsilon_{Hodo} = \frac{\text{Extrapolate} \ \&\& \ \text{Hit}}{\text{Extrapolate}}$$

Outer Trigger Hodoscope Efficiency HO03

HO03Y1 Hits



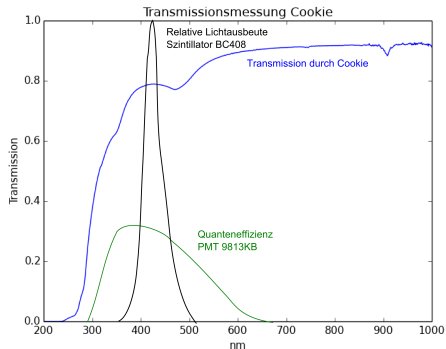
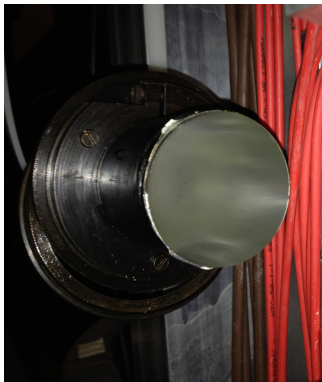
HO03Y1 Efficiency



Summary Efficiencies

<i>TriggerSystem</i>	<i>OverallEffi.</i>	<i>BadStripes</i>
Middle (horizontal)	99	1
HM04Y UP	99	0
HM04Y DOWN	97	1
HM05Y UP	100	0
HM05Y DOWN	99	0
Outer	98	1
HO03	97	1
HO04Y1	99	0
HO04Y2	99	0

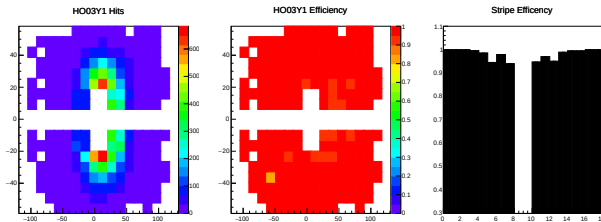
HO03 Maintenance



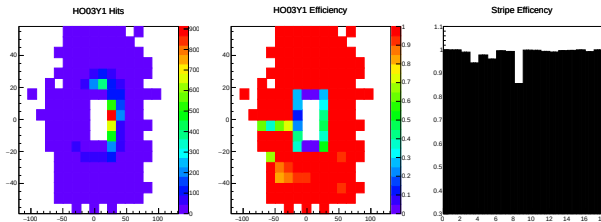
- Removing of cookies
- Cleaning of all lightguides

Comparission HO03 2012 Data with 2014

2012



2014

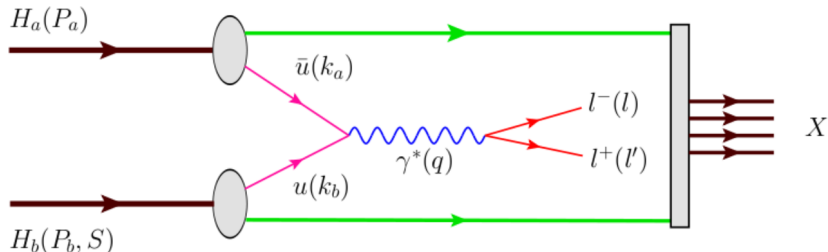


Trigger Changeover for Drell-Yan:

- Shift of Middle hodoscopes
- Modification of the Outer Trigger geometry
 - Two new slabs in HO03
 - Building 12 new slabs for the symmetrical hole in HO04
- After successful test,s installation of new slabs
- Check of hodoscope efficiencies

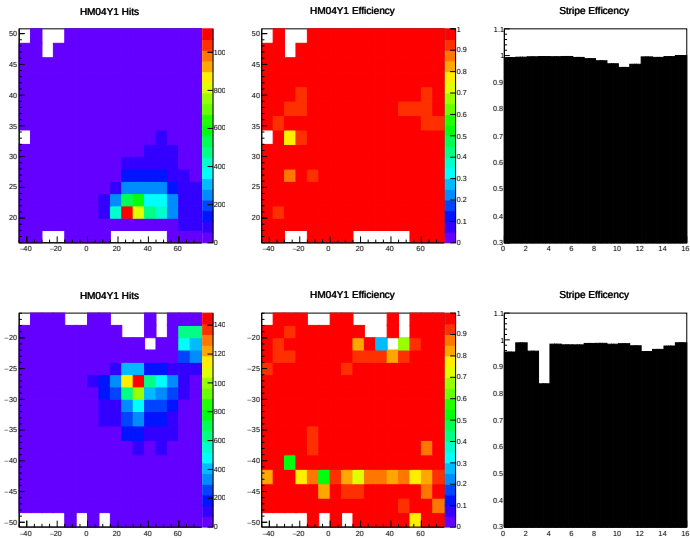
Thank you for your Attentation

Questions?

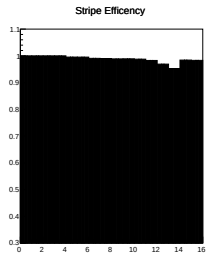
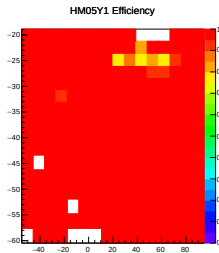
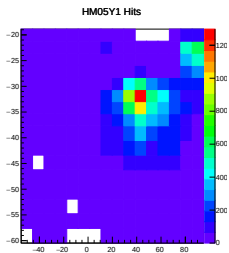
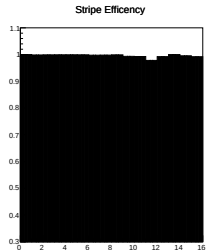
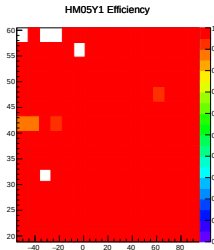
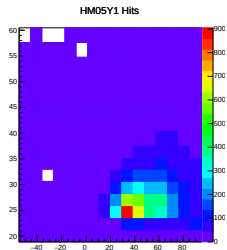


- $\pi + p \rightarrow \mu^+ + \mu^- + X$
- hadron/hadron scattering with two leptons in the outgoing channel
- Hadrons absorbed
- Measuring of the angle distribution of the remaining lepton pair

HM04



HM05



HO03

