
WP8: TEST BEAMS

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5TH EOI-15 ND280 UPGRADE MEETING

Thanks to Emilio for his help

INTRODUCTION

- ▶ Test beams at CERN for end 2018 runs are being organised to test prototypes of the different subsystems integrated together
- ▶ test beams for some sub-detector are ongoing independently (e.g. TOF, target)
- ▶ Need to define soon what we need and draft our request

Focus on test beams at CERN next year. Test beams for physics measurement to be performed elsewhere have a different time scale and still considered but not discussed in this talk.

WHAT DO WE WANT TO TEST

- ▶ Test beams at CERN for end 2018 runs are being organised to test prototypes of the different subsystems integrated together
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WHAT DO WE WANT TO TEST

▶ Field cage : yes

- uniformity of the E field
- possible deformation of the structure?
- dead region on the sizes of the MM

field cage prototype foreseen. About 1 m (long) x 0.5 m (width) x 1 m (height) hosting 2MM modules

▶ MM : yes

- dEdx would need to be studied (see [P. Colas talk](#))

▶ Target (SuperFGD) : yes

- needs will be specified after October test beams

▶ TOF: no

- TOF prototype (Ship project): 32 bars, 168cm long (cast plastic+ SiPM array readout)
- If prototype funded, test beam already arranged with HPTPC
- no need for further tests, but ok to participate to atmTPC tests

WHAT WE WOULD NEED

- ▶ gas system for the TPC
 - in contact with Roberto Guida (CERN)
 - no major problem in our request. Need to define the gas mixture to use by begin 2018 (need time to get if not in stock)
- ▶ space and time to leave the prototype detector assembled, possible taking comics data (uniformity E field)
- ▶ ...?
- ▶ man power during the test beams?

TEST BEAM AT CERN: STATUS

- ▶ call for beam requests for 2018 should open sometime in October with a deadline in end-November / early December
- ▶ a template for the request to be filled.
- ▶ Preliminary contact with the SPS coordinator established in August. Few basic information about our future request already given (2 weeks, low energy beams at T9 or T10)
 - ▶ Request for longer period from HPTPC submitted to SPSC (see next talk)

MAGNET AT CERN

- ▶ No magnet are available at the East area
- ▶ dipoles are instead available at EHN1 and on the H2-H4 beam lines ()

MNP22



- standalone magnet
- located downstream H2 dump
- large aperture of 500mm
- B field up to 600mT (1000A solenoid current)

Large Magnets available for tests with beam

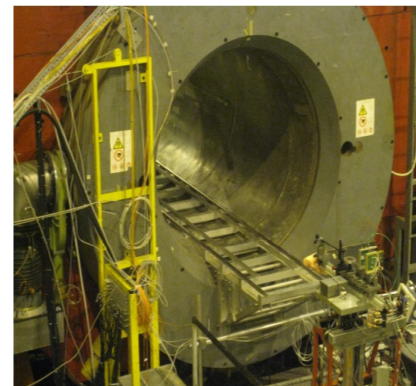


Goliath

- EHN1, H4 beam line
- Large classical dipole
- 100 x100 x100cm
- 1.5 T field

Morpurgo

- EHN1, H8 beam line
- superconducting dipole
- 1.6m diameter, 4m length
- 1.5T field



CMS M1 magnet

- EHN1, H2 beam line
- superconducting dipole
- 82 cm gap, 1.4m diameter
- 3 T field

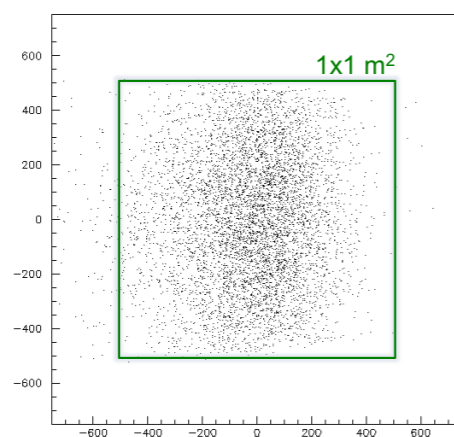
→ MNP22: A stand alone magnet test facility available to the users.

Info: https://sba.web.cern.ch/sba/Documentations/MNP22/mnp22_controlbackup.htm

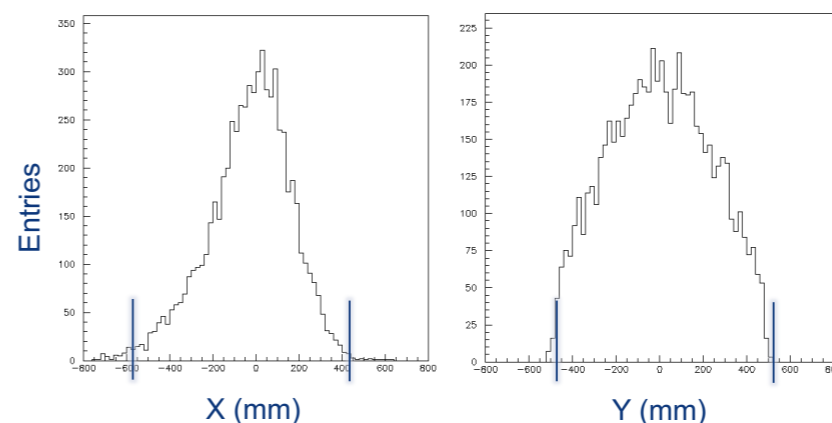
POSSIBILITY TO HAVE 1M2 BEAM AT T9

- ▶ Possibility to have a 1x1 m² beam spot at T9
- ▶ Typical momentum of 1GeV. Low rate (100/spill).
- ▶ beam is a mix of electrons and pions, roughly 50%-50% (40%-60%) if electron-optimised (hadron-optimised) target
- ▶ to be realised, part of the existing beam-line have to be moved. If approved, it such kind of runs would be planned for the end of 2018 runs

Spot at end of T9 zone



Profiles towards the end of the T9 zone



L. Gatignon

CONCLUSIONS

- ▶ Need to define our tests and needs soon to be ready for the incoming call for beam request.
- ▶ the SPS coordinator has been already informed of an incoming request from our part of a 2weeks beam time in T9 or T10
- ▶ We need to define if we want to leave our equipment longer than the allocated beam time. Parasitic use of the test beam area should be request as well