

RD51 test beam and irradiation programmes

Feedback from
RD51 members

Test beam planning CERN PH-DT-GDD:

- Large area GEM project (Serge Duarte Pinto):
 - 2 test beam campaigns in 2009
 - Trigger, high spatial resolution tracker ($< 0.5\text{mm}$)
 - Highest achievable rate
 - MIPS and highly ionizing beams
 - Construction for mechanical positioning (light detector, $\sim 1\text{kg}$)
 - dimension of the detector: $70 \times 70 \text{ cm}^2$

- Radiation hardness of triple GEM and Bulk Micromegas detectors and components (Gabriele Croci):
 - irradiation program for components and detectors starting in 2009
 - total integrated dose of $10^6 - 10^7 \text{ Gy}$
 - photons as well as hadrons irradiation
 - possibility to apply voltage on detectors
 - volume of detectors: $15 \times 15 \times 2 \text{ cm}^3$

Test beam planning CGEM-KLOE2 (LNF-INFN)

Cylindrical GEM as Inner Tracker for KLOE upgrade (G.Bencivenni):

- 1 test beam in 2009
- test of XV-readout (650 μm pitch) for final CGEM design, using small planar prototypes (100x100mm² active area)
- B-field (0.3-1.0 T) operation test ($B \perp E_{\text{drift}}$)
- external trackers needed ($\sigma_x \sim 100 \mu\text{m}$)
- different gas mixtures (Ar/CO₂ & CF₄ added gas mix.)
- MIPS beams
- dimension of the detector set-up: 400X400 mm²

Test beam planning pixelMM for Compass (CEA Saclay)

ATLAS MICROMEAS

Test-beam activity foreseen for years 2009-2010 (P.lengo)

2009:

- 3 TB periods with muon/pion beam
- External trigger (scintillators) + tracker (res<100um)
- Test of different FE electronics
- Mid-size prototype (40x50 cm²) + Large prototype (~50x200 cm²)
- Mechanical installation for moving/rotating the chamber

2010:

- 2-3 TB periods with muon/pion beam
- External trigger (scintillators) + tracker (res<100um)
- Large prototype (~50x200 cm²) + full scale chamber (~ 100x200 cm²)
- Mechanical installation for moving/rotating the chambers
- Ageing test with photons/neutrons
- Integrated charge: ~0.3 C/cm²

Specific requirements for TB

- Largest detector: 1x2 m²
- CF₄ and flammable gas mixtures
- High resolution (~100μm) tracker
- High rate beam.
- MIPS (pions preferred) but also high-ionizing beam
- Magnetic field
- Mechanical Support allowing X-Y position and rotation

Specific requirements for irradiation facilities

- Largest detector: 1x2 m²
- Mechanical Support allowing X-Y position and rotation
- Very intense photon fluxes, up to 10⁷ Gy
- Also neutrons or hadrons in general