

WP13.4.3

***Control of foil/micromesh  
mechanical tensioning by optical  
techniques***

Laboratori Nazionali di Frascati dell'INFN

INFN Bari

INFN Bologna

- Flatness of MPGD foils/meshes must be assured within about 100microns and monitored over long term detector lifetime (10-20 years)
  - Flatness QC during assembly
  - Continuous monitoring during operation

# From AIDA2020 proposal

- ***Control of foil/micromesh mechanical tensioning by optical techniques***
  - engineering an optical system for quality assessment of mechanical tensioning and flatness of MPGD films and meshes.
  - prototyping integrated Fiber Bragg Grating sensors for monitoring the mechanical tension of MPGD films (GEMs) and meshes (MICROMEAS).

# Sharing of activities among partners (from AIDA2020 proposal)

- Laboratori Nazionali di Frascati
  - Engineering, Fiber Bragg Grating sensors deployment, tests in clean room
- INFN Bari
  - Film stretching mechanics
- INFN Bologna
  - Tests of stretched foils

# AIDA2020 Milestones

MS Number	MS Description	Task	Due by	Result type
MS13.8	Optical system for the quality assessment of MPGD foil/mesh mechanical tensioning	13.4.3	M12	Demonstrator
MS13.9	Integrated FBG sensors for monitoring the mechanical tension of MPGD films and meshes	13.4.3	M24	Prototype

# Internal and official MS

Milestones	Year 1	Year 2	Year 3	Year 4
Design/qualify an optical interferometric system	Dark Red	Light Blue	Light Blue	Light Blue
Engineering interferometric system MS13.8	Dark Red	Light Blue	Light Blue	Light Blue
Qualify FBG sensors	Light Blue	Dark Red	Light Blue	Light Blue
Proof of concept integration of FBG MS13.9	Light Blue	Dark Red	Light Blue	Light Blue
Long term characterization of FBG	Light Blue	Light Blue	Dark Red	Light Blue
Qualification at test beams	Light Blue	Light Blue	Light Blue	Red

# Additional Funding

- Additional funding will be asked for to INFN in the framework of GEM upgrade Phase 2 R&D.
- AIDA2020 WP13.4.3 activity will benefit from existing equipment, infrastructure and consumables funded by INFN