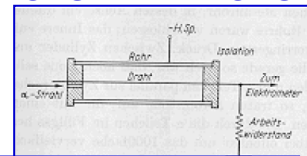


AIDA_{innova}

WP7: Gaseous detectors

Silvia Dalla Torre



Su scelta del management:

Conveners della fase di formazione del Progetto:

- Gabriella Catanesi, Silvia Dalla Torre, Franco Grancagnolo, Beatrice Mandelli, Burkhard Schmidt, Guy Wilkinson

Coordinatori attuali:

- Silvia Dalla Torre, Burkhard Schmidt

34 Eols related to gaseous detectors (su 163, il 23%)

- related to RPCs: 10
- related to MPGDs: 18
- related to large volume GDs and DCs: 6

Eols il cui contenuto e' presente (in tutto o in parte) in WP7

- related to RPCs: 3
- related to MPGDs: 3
- related to large volume GDs and DCs: 3

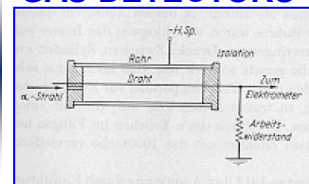
Conveners:

- suggesting the scientifically valid ideas

Management:

- making the choices on the base of the **overall project policy** (privileging the support to well-defined medium – term projects); also **distribution of resources among countries** considered





About RPCs

Eol25 (Scioli, INFN-BO)
MRPCs for fast timing at high incident flux of charged particles

SINERGIES

t-res (20 ps) and rate capability (50 kHz/cm²)
 → everywhere, in part. Hadron physics

Task 7.2. Multigap RPCs (MRPCs) for fast timing and Eco-friendly gas mixtures for RPCs

- Developing and testing material (thin plates of low resistivity glass)
- Construction, characterisation and test beam of small-size prototypes
- Construction of 1×1 m² prototypes with the new readout plane structure for a semi-digital hadron calorimeter (SDHCAL)
- Test beam study of the shower time development in an SDHCAL, equipped with the prototype detectors
- Identification and characterisation of new gas mixture candidates
- Validation of the gas mixtures after large integrated doses at GIF++

Eol56 (Piccolo, INFN-LNF)
Study of eco-friendly gas mixtures for Resistive Plate Chamber detectors

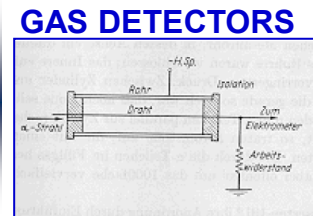
SINERGIES

RPC with eco-friendly gasses: wherever RPCs are/will be used

Eol58 (Laktineh, Lyon/CNRS)
Timing for SDHCAL

SINERGIES

Semi-digital calorimetry → e+e-



About MPGDS

EoI114 (Verwilligen, INFN-BA)
Development of resistive electrodes for MPGD detectors for future collider experiments

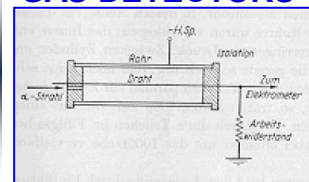
SINERGIES
Mastering resistive layers in MPGDs
→ All future MPGD R&D and applications

Task 7.3. Development of resistive electrodes for MPGDs and Industrial engineering of high-rate μ -RWELL detector

- Production of Diamond Like Carbon (DLC) with ion beam deposition and pulsed laser deposition
- Study of the resistance of graphene to polyimide etching liquids
- Characterisation of $10 \times 10 \text{ cm}^2$ foils by DLC and graphene
- Industrial production of small-size prototypes and their characterisation
- Industrial production of large-size prototypes ($\sim 0.5 \text{ m}^2$) and their characterisation

EoI52 (Cibinetto, INFN-FE)
Industrial engineering of high-rate μ -RWELL detectors with bi-dimensional readout

SINERGIES
TT of large μ R-WELL production
→ LHCb, e+e-



About large-size gaseous detectors

Eol17 (Grancagnolo **INFN-LE**)

Cluster Counting/Timing: data reduction and pre-processing of drift chamber signals sampled at high rates

SINERGIES

Cluster counting in large DCs
→ e+e-

Task 7.4. A 4-channel electronic board prototype for cluster counting and Hybrid readout for high pressure gas TPC for neutrino physics

- Design electronics and realise a 4-channel prototype for cluster counting in ultra-light drift chambers
- Identification and characterisation of adequate gasses
- Construction of a small-scale TPC prototype (~10 l) with a hybrid charge and optical readout

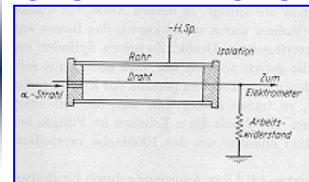
Eols113 & 122 (Deisting, Royal Holloway, University of London; Lu, Oxford)

High pressure gas time projection with hybrid light and charge readout;

Novel Gas Mixtures in High-Pressure Time Projection Chambers for Accelerator-Based Neutrino Physics Experiments

SINERGIES

High pressure TPC for ν cross-section measurements → ν -physics at accelerators



MPGD for PID applications

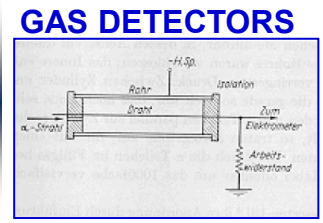
Task 7.5. Photon detectors for hadron particle identification at high momenta

- Development of MPGD single photon detectors for compact Ring Imaging Cherenkov detectors
- Comparison of measured prototype characteristics with Silicon Photomultipliers (SiPMs) and Large Area Picosecond Photodetectors (LAPPDs)

EoI24 (Dalla Torre, **INFN-TS**)
 Photon detectors for hadron particle identification at high momenta with compact RICHes

SINERGIES

Development of the compact RICH concept for h-PID at high momenta → EIC, e+e-, COMPASS



TASK	INFN							CERN	CIEMAT	CNRS\LPC	CNR\IP2I	CUNI	CSIC\IFIC	RHUL	UOXF	USC	industries		
	BA	BO	FE	LNF	LE	RM3	TS										CAEN	ELTOS	Picotech
7.1																			
7.2																			
7.3																			
7.4																			
7.5																			

COMMENTI

- Presenza trasversale e qualificata INFN
- Tutte le industrie sono legate ad attivita' INFN

Finanziamento

- 349 k€ / 858 k€ to INFN