

SMART: Supersensitive Multipurpose Advanced Radiation Technology

The aim of the project is to develop a prototype of a high sensitivity integrated system for complex monitoring of hazard environmental conditions: appearance of flames, sparks, smoke and dangerous gases including Rn.



Current status of progress:

% of deliverables completed so far: 80%

% of budget (100 kEUR) spent so far: 50%

Any remaining uncertainties w.r.t planned deliverables

No

Electronics development for integration of the system to REMUS

Using students (PhD/MSc/BSc) in the project?

No

Yes; Directed students from Alto University, NTNU and CESP

Any interactions with other funded ATTRACT projects so far?

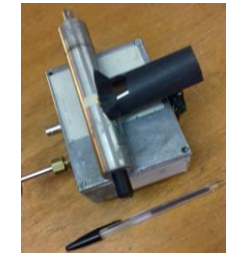
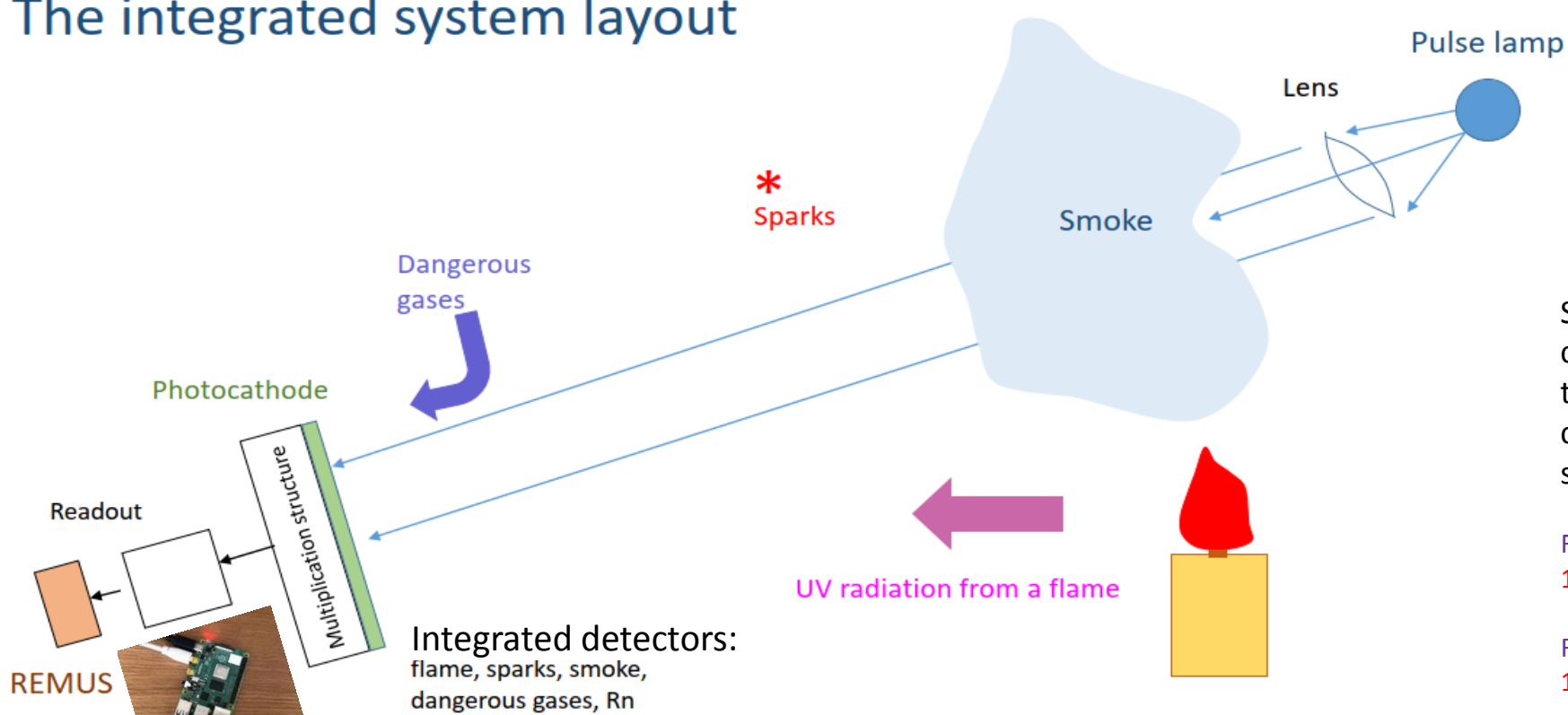
No

Yes; An invitation was sent to ATTRACT/HYPER project as an attempt to establish a collaboration on environmental monitoring including hyper-spectroscopy

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The integrated system layout



Sensitivities compared to the best commercial sensors:

Flame and spark detector – 1000 times more sensitive

Remote smoke detector – 10 times

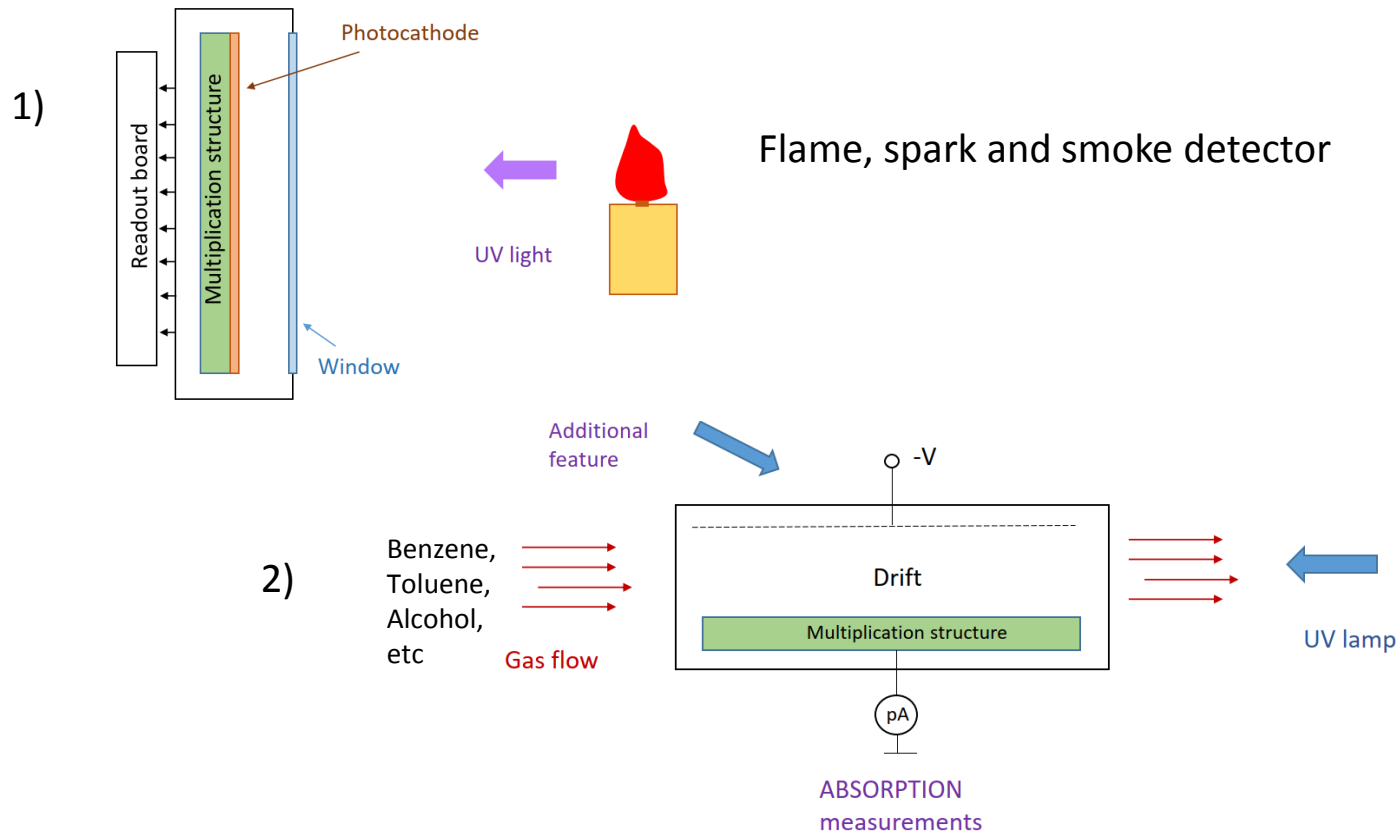
Dangerous gases – 10 times

(Radiation and Environment Monitoring Unified Supervision)

Open Hardware, embedded Linux computer



SMART: Operational principle of the detector technology

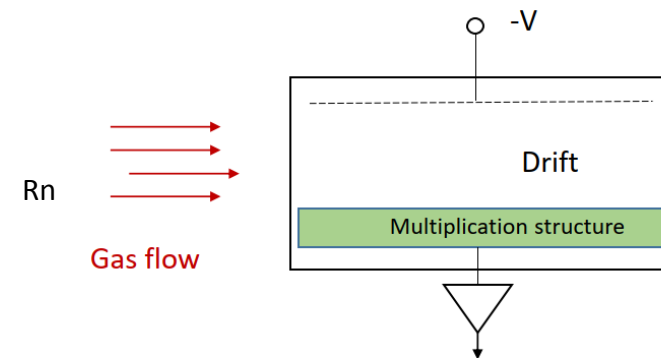


Multiplication structures:
GEM, MWPC, single wire

All based on proven R&D programs performed for particle physics detectors at CERN and HEP labs

Sensitivity much larger than in available specialized commercial detectors

Dangerous gases detectors



More information can be found in:
<https://twiki.cern.ch/twiki/bin/view/SMART/WebHome> (photos, Videos)

The flame detector was demonstrated at Open days at CERN
Preliminary results were presented at the RD51 meeting at CERN
Paper, describing some of our results will be submitted to the publisher shortly

If your project were to be selected for ATTRACT Phase 2:

How would your technology scale up to become an industrial product/system?

With the help of commercial partners, the existing laboratory prototype should be converted to industrial prototypes

With who you would need to partner for this to happen? (No names, just profiles of type of organizations)

Some industrial partners have already been contacted and expressed their interests: Fenno-Aurume (Finland), NAICAM (Italy), Vision TIR (Spain), REMOS (Russia)

Have you already discussed this with KT Group?

Yes, we are in regular contacts and they helped in opening contacts with industrial partners

What applications will you demonstrate with value for science, industry and society? (Examples)

High sensitivity integration system for complex monitoring of hazard environmental conditions and to study the possible correlations of earthquake prediction through a network of low cost Rn detectors

Any comments, remarks or observations you would like to make to CERN? The support of CERN, allowing to use its infrastructure and KT group assisting us in contacts with commercial partners, yed a essential role for the efficient development of our programme