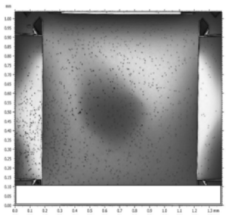
PARTICLES MICRO-ANALYSER

MEMS microbalances for aerosol and bio-aerosol real time detection in indoor environments.

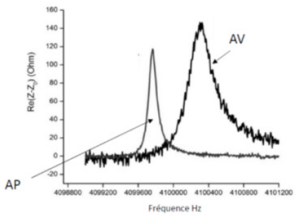
ERGANEO
L'AVENIR EST FAIT D'AUDACE

PRESENTATION

The invention is an instrument measuring the concentration of fine particles in the air. It consists of an aerodynamic stage screening device directing aerosol particles according to their mass to microbalances.
The choice of this instrumentation is in accordance with the standard procedures used in the field of aerosol measurement to evaluate indoor air quality. The desire to target aerosols of biological origin such as microfungi is linked to health issues, as these microbes cause allergies.
Real-time and continuous monitoring of the presence of particulate matter in the air will allow more accurate analysis of outdoor and indoor air quality.



Impact of the particulates on the membrane.



Frequency shift of the resonator while solid particles impact the surface

Algré et al. PCT/FR2019/052011 ©

Air quality - Sensors - Microsystems - MEMS - Microbalance
Micro impactors - Micro/nano structuration
Particle pollution analysis - Mass measurement - Aerosol

COMPETITIVE ADVANTAGES

- 3 combined criteria: Good sensitivity (quality factor superior to 15000), Uniform response of the sensor, Large active area
- All silicon microsystem: reduction of fabrication time and cost
- Electrostatic actuation
- Larger size spectrum (also efficient on particles of medium size: 10^{-18} to 10^{-9} grams)
- Self-cleaning system allowing the sensor to perform in situ and continuous analysis of an aerosol flow, for continuous measurement of mass concentration.

INTELLECTUAL PROPERTY

International patent application PCT/FR2019/052011
Patentability of all the claims by the European Patent Office

APPLICATIONS

- Indoor air quality: public buildings, hospitals, control sensors, ventilation triggering, fire hazard
- Connected home automation in individual housing (asthma, allergies, etc)

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DEVELOPMENT PHASE

- ☑ Validation of the different technological blocs: TRL 2-3