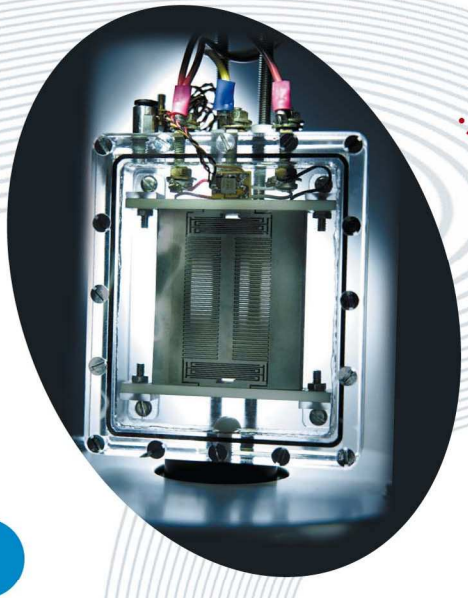
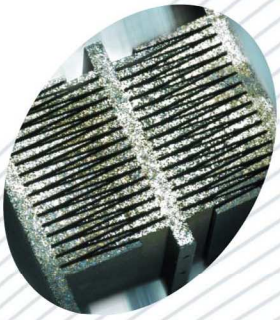
AgitAlim

The energy of research

• Energy scavenging - Wireless system - Electrostatic transduction - Vibration





> Description

Agitalim is an autonomous system able to scavenge energy from mechanical vibrations thanks to an innovative
electrostatic transduction. Mechanical vibrations can be converted into electricity with a very high efficiency. Very small in size (<20 cm^3) the converter is designed to scavenge mechanical vibrations over a large band of frequencies and amplitudes with an overall efficiency higher than 60%

Technologies developed

- Electrostatic tranducsction
- Asynchronous electronics
- Innovative integration

Associated research topics

- Energy transduction
- Sensors networks
- Ultra Low Power electronics
- Vibration energy
- Geometrical optimization

Potential fields of application

- Transport (speed, temperature, pressure air quality sensors...)
- Industry (temperature, position and speed sensors)
- Aeronautics (structure monitoring, pilot assistance...)
- Home automation (Wireless and self-powered switches...)
- Environment monitoring (tsunami detection...)
- Security (area monitoring...)
- Telecommunications (wireless microphone...)
- Healthcare (implant, pacemaker...)

Presentation

Advances in low power electronics, microsystems design and energy scavenging techniques open up the possibility to build small and autonomous wireless sensor nodes.
By avoiding the use of common chemical energy sources and their periodical replacement, the system lifespan can then be significantly increased and its ecological impact reduced.

In Agitalim we have focused on energy scavenging from mechanical surrounding vibrations with a system based on electronical transduction.
In accordance with commonly available vibration levels and vibration frequencies, three types of low frequency and wideband transducers have been designed.

The two first are macroscopic tungsten demonstrators (respectively 10 and 100g in weight) used for the concept validation, and the last one is a micro-sale one realized with MEMS (Micro Electro Mechanical System) techniques (weight of 1g) able to address applications requiring a high level of miniturization.
A scavenged power of more than 700 µW has already been demonstrated with the tungsten structure for a 50Hz excitation of only 80µm in amplitude.

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