

26087 Magnetic MEMS Sensor Platform

The Technology

A sensor platform technology, in which smart magnetic layers have been added to the cantilever beam in Micro-Electro-Mechanical systems (MagMEMS), has been developed by researchers at the University of Sheffield.

In sensing applications, the MEMS cantilever beam is coated with appropriate functionalised layers (FL) to detect specific analytes. The analyte sticks to the FL causing a mass increase and change in the resonant frequency of the cantilever. Standard means of measuring this change in resonant frequency use either optical or electrical detection protocols. Both methods add cost to the fabrication and limit the utility of the detection device.

Key features and benefits of the Sheffield MagMEMS technology are:

- No direct contact or line of sight access to the cantilever is required. Inductive coupling is used, giving the possibility of deployment in remote or hostile environments: this extends the application area of such technology.
- Using the magnetic field dependence of Young's modulus (the ΔE -effect) in carefully chosen smart magnetic materials, the beam resonance can be tuned. This means that the shift in resonant frequency does not need to be tracked, detection is only at resonance: this dramatically simplifies system complexity and hence cost.

Intellectual Property

A patent application has been filed covering various aspects of the technology and is currently in National/Regional phase.

The Opportunity

The MagMEMS sensor platform technology offers the opportunity for wireless integration into microfluidic devices for rapid onsite detection systems. The development of appropriate FLs would offer a wide range of application areas including:

- Biosensors for medical diagnostics (e.g. detection of pathogens such as MRSA)
- Chemical analysis (e.g. fuel additives)
- Environmental monitoring (e.g. detection of persistent chemicals in the water system)

Researchers at the University of Sheffield have demonstrated the MagMEMS platform. We are now seeking commercial licensing and collaborative development opportunities in a range of sensing applications.

For commercial enquiries on this technology, please contact Andrew Tingey, quoting reference 26037.

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