NEW ENABLING TECHNOLOGY

NIST has made long awaited advances in the creation of magnetometers and detecting magnetic fields.

The chip size NIST atomic magnetometer has at least one sensor head void of extraneous metallic components, electrical contacts or electrically conducting pathways. This novel sensor contains an active material vapor, such as an alkali vapor, that alters at least one measurement parameter of light passing through, when in a magnetic field. The sensor has an absorptive material configured to absorb laser light and thereby activate or heat the active material vapor.

BETTER FASTER EFFICIENT TECHNOLOGY

Advantages include: Elimination of electrodes in direct contact with the patient’s body; Richer content of information; and Non-interference of the sample being monitored unlike the large-scale, expensive, and difficult to operate current atomic magnetometers.

The NIST Atomic Magnetometer allows for considerable reduction in the size, power consumption, and thus manufacturing cost.

Mobile magnetoencephalography is now a possibility.

IMMEDIATE USE IN MAGNETOENCEPHALOGRAPHY FOR TREATMENT OF EPILEPSY, AUTISM, SCHIZOPHRENIA, ATTENTION DEFICIT HYPERACTIVITY DISORDER AND DYSLEXIA

- Brain signal detection
- DC sensitivity
- Detection of the relaxation and transport of magnetic nanoparticles for imaging and flow measurement
- Detection of nuclear magnetization in very low magnetic fields
- Multichannel system can image magnetic sources inside the head
- Detection of magnetic fields produced by the human heart and brain
- Smaller
- Less expensive
- Less power consumption

CONTACT

Technology Partnerships Office (TPO)
National Institute of Standards and Technology
Gaithersburg, MD 20899
TPO@NIST.GOV
Method for Detecting a Magnetic Field Is Revealed
(Refer to Flow Diagram)

- Physiological mapping
- Geophysical mapping
- Defense Applications

- Space Science
- CubeSats
- Healthcare

Opportunity for multiple collaborative development relationships with research and development. There is an opportunity for collaboration with fabrication facilities!

The Solution for a Host of Issues That Plague Multiple Industries

The NIST Atomic Magnetometer has multiple applications:
Measurement of magnetic fields from living systems;
Detection of magnetic anomalies such as submarines and ships for defense purposes, Measurement of geomagnetic fields, which are useful for oil and mineral exploration; and Measurement of geomagnetic fields for positioning and navigation.

Market

Benefits to market include multiple usages, inexpensive, low power consumption, and possible mobile magnetoencephalography

Partnerships

Cooperative Research and Development Agreements (CRADAs), Patent License Agreements (PLAs) Abound

Commercial opportunities for the detection of magnet fields are limitless: geophysical mapping, underground deposit detection, navigation, nuclear magnetic resonance, space science, CubeSats, physiological mapping (e.g., human heart and brain), and much more.

Flow diagram showing a method of detecting a magnetic field with an atomic magnetometer.

Multiple Applications Abound!

Contact

Technology Partnerships Office (TPO)
National Institute of Standards and Technology
Gaithersburg, MD 20899
TPO@NIST.GOV