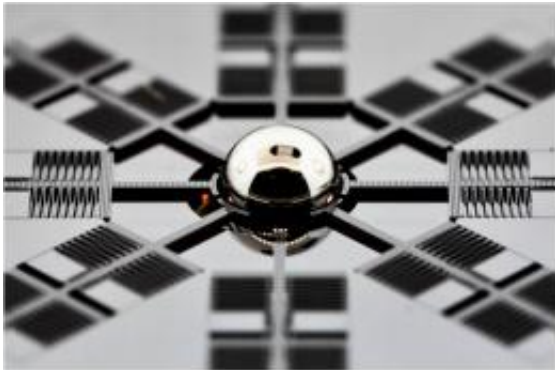


New sensor sought to enable military missions in GPS-denied areas

April 17 2012



Many U.S. Military systems, such as missiles, rely on the Global Positioning System (GPS) to provide accurate position, orientation and time information while in flight. When GPS is inaccessible, whether as a result of a malfunction or as a consequence of enemy action, information critical for navigation must be gathered using the missile's on-board sensors.

DARPA's Chip-Scale Combinatorial Atomic Navigator (C-SCAN) effort seeks an atomic inertial sensor to measure orientation in GPS-denied environments. Such a sensor would integrate small size, low power consumption, high resolution of motion detection and a fast start up time into a single package.

“Platforms such as missiles rely on GPS for a variety of information,” explained Andre Shkel, [DARPA](#) program manager. “When GPS is not available gyroscopes provide orientation, accelerometers provide position and oscillators provide timing. The new C-SCAN effort focuses on replacing bulky gyroscopes with a new inertial measurement unit (IMU) that is smaller, less expensive due to foundry fabrication and yields better performance.”

The inertial measurement unit sought by C-SCAN will co-integrate both solid state and atomic inertial [sensors](#) into a single microsystem. This new IMU would benefit from devices with dissimilar physics, yet complementary characteristics: short startup times, and long-term, stable performance.

Before C-SCAN can be built, research is needed to explore the miniaturization and co-fabrication of atomic sensors with solid-state inertial sensors. Algorithms and architectures are sought to seamlessly co-integrate the components. Those wishing to participate in the C-SCAN effort are encouraged to review the full solicitation located at www.fbo.gov.

Provided by DARPA

Citation: New sensor sought to enable military missions in GPS-denied areas (2012, April 17) retrieved 23 April 2024 from

<https://phys.org/news/2012-04-sensor-sought-enable-military-missions.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.