Coin-Sized Sensor Can Detect Bombs

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ARLINGTON, Va. (AFPN) -- An Air Force Office of Scientific Research-funded team has created an inexpensive sensor the size of a penny that detects bombs made with improvised peroxide explosive devices.

The University of California at San Diego research team includes Dr. William Trogler, one of the inventors of the electronic device, and Drs. Andrew Kummel and Ivan Schuller. Together, they created the small sensors using ultra thin films. The sensors are made of cobalt and copper and have a fast response time and sensitivity that enables them to detect even minute amounts of peroxide vapors. When peroxide is present, the film made of cobalt shows a reduction in current while the copper films show an increase.

"The main, long-term goal of our basic research program is to develop the science and technology to create rugged, lower power, small-sensor packages with high chemical properties that are practical for military purposes and in homeland security," Dr. Trogler said.

He noted that low power micro and nanosensors are ideally suited for small unmanned air vehicles, or UAV, platforms. UAVs and micro UAVs can use the technology in remote sensing for protecting facilities from chemical warfare agents when investigating chemical properties of a vapor cloud.

Dr. Trogler emphasized that the team's chief challenge is to extend the array sensing approach to broader applications.

"In order to do this, we need further basic research to understand and control the interaction between the agents, toxins, fuels and the central metal ions in the sensor materials," Dr. Trogler said.

Initial work with a sensing algorithm is promising in yielding test results from an array.

"We hope to develop this into a practical microsensing array platform for a wide range of agents, toxins, fuels and manufacturing of specific odors," he said.

Previous devices created for similar detection purposes were large and expensive. The current sensor cost less than a dollar per device. The university has applied for a patent on the ultrathin sensor, but its licensing has not been finalized. In the meantime, it has attracted the interest of potential licensing partners who favor its size, cost and additional potential use in commercial applications.

By funding research programs like the one mentioned here, led by Dr. Trogler and his team at UCSD, AFOSR continues to expand the horizon of scientific knowledge through its leadership and management of the Air Force's basic research program.

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