



## **Success Story**

### **ENHANCED COMPACT MID-INFRARED CHEMICAL REMOTE SENSING**



The Sensors Directorate funded a Small Business Innovation Research Phase III project for LaSen, Inc. in Las Cruces, New Mexico, to build a compact, portable sensor capable of determining the real-time location as well as identification and concentration levels for a number of chemical vapors and aerosol clouds. Directorate engineers needed this system to meet the needs of possible environmental incidents, such as toxic chemical spills, or wartime/terrorist activities such as release of chemical agents.



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### **Accomplishment**

LaSen engineers designed and fabricated a compact lightweight laser radar system that uses a solid-state laser operating in the 3-5 micron band. Engineers demonstrated the system at White Sands Missile Range and used the system to map out-gassing from an underground fuel spill. The sensor uses a technique known as Differential Absorption Ladar to detect and measure chemical clouds at ranges of up to 2 kilometers.

Directorate engineers are studying this same technology for use in a number of Air Force tactical applications such as finding military targets concealed by camouflage or foliage. Other applications include detecting chemical agent production and storage facilities as well as agent releases into the atmosphere.

Directorate engineers estimate a 25% reduction of the current costs of conducting regulatory mandated surveys on public lands and pipeline right-of-ways by installing this device on an aircraft. They are also considering using this technology as part of their Active Multi-Spectral Imaging program.

### **Background**

LaSen, Inc. plans to obtain certification and acceptance of this technology by natural gas companies to provide mapping and leak monitoring of their pipelines as a commercial service. Conservative estimates predict that such a service could generate >\$100M annually. Other possible applications include monitoring dumpsites, searching for illegal toxic dumping, environmental compliance monitoring, and searching for leaks in underground oil and natural gas pipelines.

Sensors  
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### **Additional information**

To receive more information about this or other activities in the Air Force Research Laboratory, contact TECH CONNECT, AFRL/XPTC, (800) 203-6451 and you will be directed to the appropriate laboratory expert. (02-SN-07)