**Acquisition of Scanning Laser-Doppler Vibrometer System for Detection and Nondestructive Characterization of Interfaces**

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The objective of this grant is to purchase a Scanning Laser-Doppler Vibrometer System PSV-300-H from Polytec PI. The system was acquired for the total cost of $166,450 of which $40,000 was provided by this DURIP grant. The rest of the funds came from research contract and matching contribution ($50,000) from Stevens Institute of Technology. The system was delivered in Spring of 2000 and was extensively utilized in ARO projects # DAAG-98-1-0402 and # DAAD19-00-1-0039 related to the Nonlinear Seismo-Acoustic Land Mine Detection and Discrimination Technique. Thus, the Scanning Laser-Doppler Vibrometer System became major measuring tool in both laboratory and field tests.

The utilization of the system also contributed to education and outreach efforts. A number of graduate students had used the system while working for the ARO and other projects. The system was extensively used for numerous demonstration of the developed land mine detection technique to potential industrial partners, investors, as well as to groups of high school and undergraduate students.

**Subject Terms**
Scanning Laser-Doppler Vibrometer System, acquisition, land mine detection and discrimination, nondestructive characterization

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**Price Code**
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1. List of manuscripts


2. Scientific personnel

Dimitri Donskoy (PI)
Edward Whittaker (Co-PI)
Nikolay Sedunov (Research Engineer)
Alexander Ekimov (Research Scientist)
Mikhail Tsionskiy (Graduate Student) – awarded master’s degree
Jianhui He (Graduate Student) – awarded master’s degree
Dennis Hromin (Undergraduate student) – awarded bachelor’s degree

3. Report of inventions

D.Donskoy and A.Sutin, Method and apparatus for acoustic detection of mines and other buried man-made objects, U.S.Patent #5,974,881, 1999

D.Donskoy and A.Sutin, Method and apparatus for acoustic detection of mines and other buried man-made objects, U.S.Patent #6,134,968, 2000


4. Scientific progress and accomplishments

The acquired Scanning Laser-Doppler Vibrometer System was extensively utilized in ARO projects # DAAG-98-1-0402 and # DAAD19-00-1-0039 related to the Nonlinear Seismo-Acoustic Land Mine Detection and Discrimination Technique. The System became major measuring tool in both laboratory and field tests allowing successful progress of these research projects. Thus, the underlaying physical mechanism of the detection technique was experimentally validated using the System.

The utilization of the system also contributed to education and outreach efforts. A number of graduate students had used the system while working for the ARO and other projects. The system was extensively used for numerous demonstration of the developed land mine detection technique to potential industrial partners, investors, as well as to groups of high school and undergraduate students

5. Technology transfer

The acquisition and extensive utilization of the Scanning Laser-Doppler Vibrometer System to the great extent supported the transition of 6.1 ARO projects to 6.2 program directed by U.S.Army SECOM at Fort Belvoir.