Department of the Navy SBIR/STTR Transition Program

Pending SYSCOM Review

Topic # N111-039

Waveguide Based Laser Beamsteerers: A Simple, Low Cost and Low SWaP Solution to a Long-Standing Problem

Vescent Photonics Inc

WHO

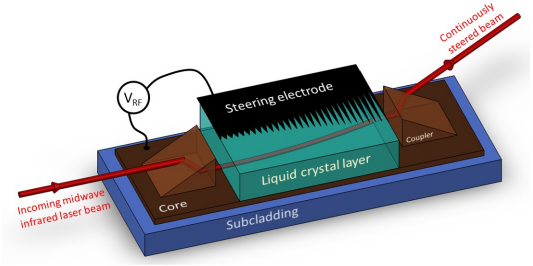
SYSCOM: NAVAIR

Sponsoring Program: PEO (T)

Transition Target: MATADOR

TPOC:
(301)757-7971

Other transition opportunities: Programs requiring remote sensing, machine vision, or free space communication components.



WHAT

Operational Need and Improvement: There is a pressing need for non-mechanical laser beam steerers for integration into advanced infrared countermeasures systems. This will eliminate costly maintenance issues associated with repairing devices based on mechanical moving parts. Our aim is to develop novel, nonmechanical, ultra-low size, weight, and power (SWaP) devices for electro-optic laser beam steering over a large field of regard with high optical throughput and low-unit cost.

Specifications Required: The goal is a simple, cost effective, low SWaP electro-optic (EO) laser beam scanner with a large field of regard (>50 degrees), fast scan rate (>2 kHz), and high optical throughput (>80%) for large beam diameters (>1 cm). Operation in the midwave infrared (MWIR) band is desired.

Technology Developed: An Electro-Optic (EO) replacement for mechanical laser beam scanners.

Warfighter Value: Recent advances in waveguide based EO scanners have enabled very large refractive scan angles (up to 270 degrees) with a simple, low electrode count in a low Size, Weight, and Power (SWaP) package. Being ultra-low in power consumption, this device meets stringent energy conservation requirements for many applications. Also, since it is completely free of moving parts, this technology will bring a large improvement in reliability, leading to increased time between repairs. Together, these characteristics will lead to a significant reduction in logistical requirements for field-deployed aircraft and vehicles.

WHEN

Contract Number: N68335-15-C-0068 **Ending on:** September 2, 2017

Milestone	Risk Level	Measure of Success	Ending TRL	Date
MWIR waveguiding acheived	N/A	Guide MWIR light for long distance in new waveguide architecture.	3	May 2016
MWIR beamsteerer design complete	N/A	Develop models for aiding design for MWIR coupling and steering	3	July 2016
First generation of MWIR beamsteerers built and characterized	Med	Steering of midwave infrared light	4	September 2016
Engineering package designed and built	Med	Steering in integrated system	5	November 2016
Improved fidelity system designed and built	Med	Adjustments made to meet requirements	6	May 2017

HOW

Projected Business Model: We would like to license this technology to a prime contractor for integration into a vehicle-based infrared countermeasures system.

Company Objectives: We aim to bring this technology to TRL 6. Then we would like to partner with a larger company to determine methods for producing the device on a larger scale.

Potential Commercial Applications: Laser radar (Ladar), stabilization of laser-based free space communications systems, remote sensing.

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