

01.01-9727 Optoelectronic Infrastructure for RF/Optical Phased Arrays

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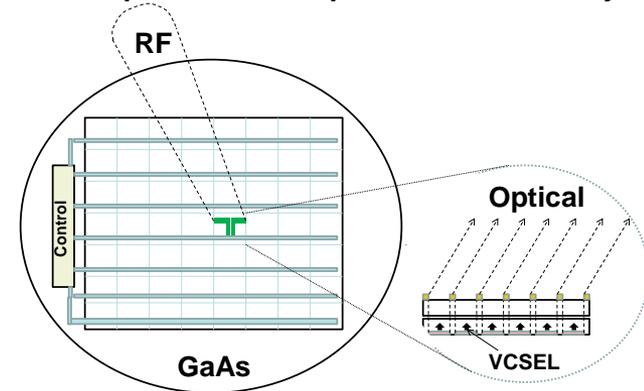
ODIS, Inc. Mansfield, CT.

Identification and Significance of Innovation

- Optoelectronic integration enables co-location of RF and surface emitting lasers
- Compact VCSEL structure enables coherent beams and phase modulators enable beam steering
- Optical distribution of RF and optoelectronic true time delay for beam steering
- Electronic steering of optical beam by VCSEL bias control

Expected TRL Range at the end of Contract : 5

RF-Optical Shared Aperture Phased Array



Technical Objectives and Work Plan

Technical Objectives

- Demonstrate feasibility of combining RF and optical emission from a single aperture
- Demonstrate feasibility of optical control of RF power and beam direction
- Demonstrate 2D optical beam emission and electronic biasing for beam steering

Work Plan

- Develop POET (Planar OptoElectronic Technology) to implement RF generation and controlled optical delay
- Develop high density VCSEL arrays to produce coherent emission with steering capability
- Determine/demonstrate device structures for optical delay, VCSEL arrays
- Combine RF generation and optical emission within a single chip

NASA and Non-NASA Applications

NASA

- Satellite sensors in the Ka and Ku band for surface, object characterization
- POET circuits for laser and RF communications, internal satellite networking, RF photonics and AD conversion, high speed systems
- POET imaging devices for LWIR, THz

Non-NASA

- Data comm, FTTH, LANS, Active Optical Cables, high speed servers
- Digital signal processors, FPA's

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RF-Optical Shared Aperture Phased Array

