NASA SBIR/STTR Technologies

O1.01-9727 Optoelectronic Infrastructure for RF/Optical Phased Arrays

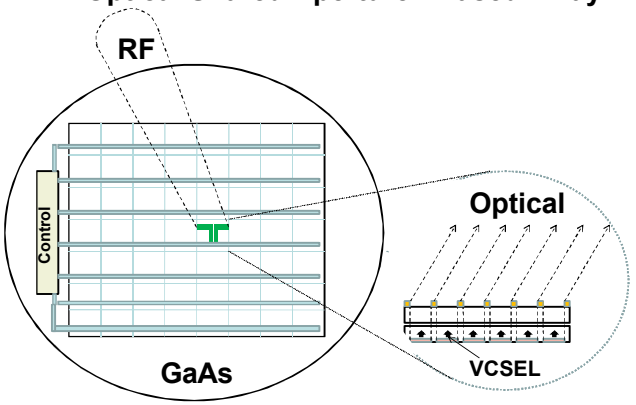
Jianhong Cai
ODIS, Inc. Mansfield. CT.

Identification and Significance of Innovation

- Optoelectronc integration enables co-location of RF and optically emitting devices
- Compact VCSEL structure enables coherent beams and phase modulators enable beam steering
- Optical distribution of RF and optical beam control
- Integrated true time delay for RF beam 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 phase modulatorsfor beam steering

Work Plan
- Develop POET integrated technology base to implement RF generation and TTD
- Develop VCSELs and phase modulators to produce coherent emission with steering capability
- 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

Firm Contacts

Geoff W. Taylor gwt@engr.uconn.edu
Jianhong Cai laser242@hotmail.com

RF-Optical Shared Aperture Phased Array