Department of the Navy SBIR/STTR Transition Program

Topic # N20A-T012
Electromagnetic Interference (EMI) Resilient, Low Noise Figure, Wide Dynamic Range of Radio Frequency to Photonic (RF Photonic) Link
Applied NanoFemto Technologies LLC

WHO

SYSCOM: NAVSEA

Sponsoring Program:

Transition Target: To replace the bulk coax cable in Naval radar and sensor frontend systems with RF photonics links with lighter weight, higher bandwidth, smaller sizes, as well as less electromagnetic interference (EMI)

TPOC: (401) 832-6887

U.S. Navy image 180614-N-GF511-0020

Other Transition Opportunities: High-performance communications systems in airplanes, satellites, as well as 5G/6G communication systems

Notes:

WHAT

Operational Need and Improvement: US Navy aircraft carriers and ships need high-performance RF antennas and transmission and receiving systems with reduced SWaP, low EMI, and high bandwidth. The technology can significantly reduce the SWaP, EMI, and increase the bandwidth.

Specifications Required: Packaged RF photonic link transmitter < 10x10x30mm; 3dB bandwidth >20GHz; SFDR greater than 114dB·Hz2/3; > 10mA photocurrent generated at the receiver

Technology Developed: Demonstrated the feasibility of the technology
Obtained optimal designs
Optimized the device fabrication parameters
Designed the high-performance PV cells.

Warfighter Value: Reduce the SWaP, EMI, and enhance the bandwidth for warfighters' surveillance and communication systems.

WHEN

Contract Number: N68335-22-C-0196 **Ending on:** Feb 20, 2023

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Phase I final report	N/A	Demonstrate the feasibility	3	1st QTR FY22
Phase II base	Low	Demonstrate a prototype	4	2nd QTR FY23
Phase II option I	Low	Package the prototype	5	2nd QTR FY24
Phase II option II	Low	Demonstrate the prototype in a subsystem	6	2nd QTR FY25

HOW

Projected Business Model: Develop prototypes in the STTR Phase II program, perform technology transition, and collaborate with prime contractors and integrate the technology with their systems

Company Objectives: Develop, mature, and commercialize the technology for the defense and commercial communication applications.

Potential Commercial Applications: 5G/6G communication systems;
RF remote sensing
Radio astronomy

Contact: Dr. Xuejun Lu, Co-founder
xuejun.lu@appliednanofemto.com (978) 761-4293