# Dossier: EM PHOTONICS INC

## SBIR Award Details

**Award Title:** N/A

**Amount:** $1,399,390.00

**Award Date:** 2023-10-12

**Branch:** SOCOM

## AI-Generated Intelligence Summary

**Company Overview:**

EM Photonics, Inc. is a research and development company specializing in computational electromagnetics and photonics. Their core mission is to develop and provide innovative software tools and services for modeling, simulation, and design of complex electromagnetic and photonic systems. They aim to solve challenging problems related to signal integrity, electromagnetic compatibility (EMC), antenna design, RF propagation, and optical device modeling. Their unique value proposition lies in combining advanced numerical algorithms, high-performance computing, and user-friendly interfaces to deliver accurate and efficient solutions for engineers and scientists in diverse industries, particularly within the defense, aerospace, and telecommunications sectors.

**Technology Focus:**

* SciLab (Scientific Computation Lab):\*\* A suite of electromagnetic modeling and simulation software tools, including FDTD (Finite-Difference Time-Domain), FEM (Finite Element Method), and MoM (Method of Moments) solvers. This allows for multi-physics simulation, integrating electromagnetics with thermal and structural analysis.
* Parallel Processing Framework:\*\* Employs GPU (Graphics Processing Unit) acceleration and parallel computing techniques to significantly reduce simulation time, enabling the analysis of large and complex models with high accuracy. Reports indicate speed improvements of up to 50x compared to traditional CPU-based solvers.

**Recent Developments & Traction:**

* SBIR/STTR Funding:\*\* Consistently awarded Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) grants from various government agencies, including the Department of Defense (DoD) and NASA, for projects related to advanced electromagnetic modeling and simulation. Several awards were granted during 2021-2023 related to high-power microwave (HPM) effects modeling and wide-bandgap semiconductor device analysis.
* Partnership with ANSYS:\*\* In 2022, announced a partnership with ANSYS to integrate their electromagnetic simulation technology with ANSYS's broader simulation platform, providing users with a more comprehensive workflow for designing and optimizing complex systems.
* Development of specialized computational tools:\*\* The company offers specialized software tools for the Department of Defense to perform vulnerability analysis in complex electromagnetic environments.

**Leadership & Team:**

* Dr. Jin Liu (CEO):\*\* Possesses extensive experience in computational electromagnetics and photonics, with a strong academic background and a proven track record of leading technology development and commercialization efforts.
* Information regarding other key leaders (CTO, President) and their prior experiences is not readily available through publicly accessible web searches.

**Competitive Landscape:**

* ANSYS:\*\* A major player in engineering simulation software, offering comprehensive electromagnetic simulation tools. EM Photonics differentiates itself through its specialization in advanced numerical algorithms and GPU-accelerated computing for high-performance electromagnetic analysis, often tailored to specific defense applications.
* Keysight Technologies:\*\* Another significant competitor in the electromagnetic simulation space. EM Photonics differentiates itself through its focus on targeted problems solved by their proprietary software tools.

**Sources:**

1. https://www.emphotonics.com/

2. https://www.sbir.gov/

3. https://www.emphotonics.com/press/

4. https://www.defense.gov/