Plan Overview

A Data Management Plan created using DMP Tool

DMP ID: https://doi.org/10.48321/D1WM1M

Title: DMSP for "A new class of high-order integral solvers for wave propagation problems in composite media"

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Funding opportunity number: PD 16-1266

Grant: https://new.nsf.gov/funding/opportunities/applied-mathematics

Template: NSF-DMS: Mathematical Sciences

Project abstract:

This text proposes the development and analysis of high-performance, highly accurate numerical algorithms for the solution of Partial Differential Equations (PDE), with application to a wide range of problems in materials science and engineering. The proposed PDE solvers apply to problems involving (i) Various physical observables (elastic and electromagnetic fields, acoustic fields in the frequency and the time domain) within and around (ii) Complex structures (photonic or electronic devices, singular geometries with corners, edges or cracks, manmade structures built from metals or modern composite materials), and containing (iii) Complex Materials—including composite elastic media, dielectrics, perfect and lossy conductors, as well as clouds of scatterers that media with dispersion and frequency-dependent absorption can describe. Motivating applications for these solvers include problems concerning the radar clutter produced by chaff, photonic crystals and metamaterials, communications, etc. These are problems of fundamental significance in a wide class of areas concerning (a) Photonics (meta-materials, nanophotonics, meta-surfaces), (b) Antenna design (communications, remote sensing), (c) Electromagnetic interference and compatibility, and (d) Geophysical exploration.

Start date: 07-01-2024

End date: 06-30-2027

Last modified: 07-08-2024

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Publication

Investigators are expected to promptly prepare and submit for publication, with authorship that accurately reflects the contributions of those involved, all significant findings from work conducted under NSF grants. Grantees are expected to permit and encourage such publication by those actually performing that work, unless a grantee intends to publish or disseminate such findings itself.

As demonstrated in the section on results from prior NSF support, the PI adhered to NSFs policy (as outlined in the Award Administration Guide, Section VI.D.4) regarding the prompt publication of the results of sponsored research, and the PI has actively shared and communicated these results with the scientific community in conferences and via other synergistic activities.

Data types and privacy

Investigators are expected to share with other researchers, at no more than incremental cost and within a reasonable time, the primary data, samples, physical collections and other supporting materials created or gathered in the course of work under NSF grants. Grantees are expected to encourage and facilitate such sharing. Privileged or confidential information should be released only in a form that protects the privacy of individuals and subjects involved. General adjustments and, where essential, exceptions to this sharing expectation may be specified by the funding NSF Program or Division/Office for a particular field or discipline to safeguard the rights of individuals and subjects, the validity of results, or the integrity of collections or to accommodate the legitimate interest of investigators. A grantee or investigator also may request a particular adjustment or exception from the cognizant NSF Program Officer.

The Expected data to be managed and results produced under this award will be in the form of new theoretical results and computational algorithms. These will continue to be prepared and disseminated through peer-reviewed archival journal publications, refereed conference proceedings, review articles, and book chapters. In addition, there will be software packages developed that implement the techniques studied in this proposal. Some of these packages will be distributed on the home pages of the PI.

Data formats.

The publications will be available in print or electronically from the pub- lishers. Software will be available as source code or precompiled binaries as appropriate.

Access

Investigators and grantees are encouraged to share software and inventions created under the grant or otherwise make them or their products widely available and usable.

PI will share the software code with Julia.

Re-use, re-distribution, derivatives

NSF normally allows grantees to retain principal legal rights to intellectual property developed under NSF grants to provide incentives for development and dissemination of inventions, software and publications that can enhance their usefulness, accessibility and upkeep. Such incentives do not, however, reduce the responsibility that investigators and organizations have as members of the scientific and engineering community, to make results, data and collections available to other researchers.

Data will be made public.

Archiving and preservation

NSF program management will implement these policies for dissemination and sharing of research results, in ways appropriate to field and circumstances, through the proposal review process; through award negotiations and conditions; and through appropriate support and incentives for data cleanup, documentation, dissemination, storage and the like.

Archiving
Data will be retained for a minimum of three years after the conclusion of the award or three years after publication.
Data storage and preservation.
Published papers will be available in print or in electronic format from the publishers, subject to subscription charges. All data that is in electronic format will be stored on personal workstations and servers managed by CAMS at NJIT, and this data is backed up regularly and periodically.

Data dissemination and sharing

Each NSF grant contains, as part of the grant terms, an article implementing dissemination and sharing of research results.

All the analyzed primary data under this award will be published promptly in the peer-reviewed literature. Published material, such as articles, dissertations, and book chapters will be accessible from the publishers, or upon request to the PI, subject to privacy, confidentiality, and the intellectual property rights policy of the individual publisher. Subscription charges may apply. Data involving proprietary information from our industrial partners is restricted from public access.

Planned Research Outputs

Text - "Article"

Planned research output details

Title	Type	Anticipated release date	Initial access level	Intended repository(ies)	Anticipated file size	License	Metadata standard(s)	May contain sensitive data?	May contain PII?
Article	Text	2027-06-29	Open	National Science Foundation Public Access Respository	1 MB	Creative Commons Attribution Non Commercial No Derivatives 4.0 International	Dublin Core matlab.task.configureMetadata Julia	No	No