Plan Overview

A Data Management Plan created using DMPTuuli

Title: Inverse problems related to the magnetic Schrödinger and Maxwell operators: increasing stability in the presence of high frequencies and recovery of singularities.

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Project abstract:

Inverse problems research concentrates on the mathematical theory and practical interpretation of indirect measurements. Applications include medical imaging, image processing, mathematical finance, astronomy, geophysics, nondestructive material testing and sub-surface prospecting. They are typically ill-posed with the modulus of continuity of logarithmic type. Hence small errors in measurements will result in exponentially large errors in the reconstruction of the target material parameters.

This project aims to develop methods and tools to obtain better stability estimates in the presence of large frequencies related to the magnetic Schrödinger equation and Maxwell equation. Our study will improve previous stability estimates. As a consequence, it will lead to constructing more efficient numerical algorithms. Recovery of singularities from scattering data will also be studied.

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Inverse problems related to the magnetic Schrödinger and Maxwell operators: increasing stability in the presence of high frequencies and recovery of singularities.

1. General description of data

Date of the plan.

27.09.2018

1.1 What kinds of data is your research based on? What data will be collected, produced or reused? What file formats will the data be in?

All data collected for this project will be taken from specialized Journals in Inverse Problems. I will also use the free open access repository arXiv.org and the repository of the University of Jyväskylä (jyx.jyu.fi). Data consists of generally accepted formats, all of them in PDF format.

1.2 How will the consistency and quality of data be controlled?

In all conversions with my collaborators, we will maintain the original information. Moreover, the data (articles) produced by this project will be previously submitted to specialised Journals in Inverse Problems where anonymous experts will check them to give the corresponding positive (or negative) reports.
Files will be stored using checksums that are used to ensure that data is not corrupted when copying, transmitting and saving it.

2. Ethical and legal compliance

2.1 What ethical issues are related to your data management, for example, in handling sensitive data, protecting the identity of participants, or gaining consent for data sharing?

The research does not include processing of personal data, does not handle with sensitive data. No experiments are involved. The results are purely theoretical.
Nevertheless, good scientific conduct is naturally followed in all data-related issues.

2.2 How will data ownership, copyright and Intellectual Property Right (IPR) issues be managed? Are there any copyrights, licenses or other restrictions which prevent you from using or sharing the data?

In this project, I would own the copyrights of the results, but the University of Jyväskylä may assume the right to the invention.

3. Documentation and metadata

3.1 How will you document your data in order to make it findable, accessible, interoperable and re-usable for you and others? What kind of metadata standards, README files or other documentation will you use to help others to understand and use your data?

The results of this project will be published in high-quality international journals as well as presented at national and international conferences and seminars.

4. Storage and backup during the research project

4.1 Where will your data be stored, and how will it be backed up?

Preprint version of all publications will be made available through the free open access repository arXiv.org. In addition, the articles will be available on the University of Jyväskylä repository (jyx.jyu.fi)

4.2 Who will be responsible for controlling access to your data, and how will secured access be controlled?

The data will be available to all researchers of the project and everyone who require the articles.

5. Opening, publishing and archiving the data after the research project

5.1 What part of the data can be made openly available or published? Where and when will the data, or its metadata, be made available?

Data itself, complete with a full description of methods, will be published as datasets are completed in free access repository arXiv.org and YJU repository. No restriction to access all data involved in this project.

5.2 Where will data with long-term value be archived, and for how long?

The data will be deposited at the University of Jyväskyla repository called JYX indefinitely, in the format originally deposited.

5.3 Estimate the time and effort required for preparing the data in order to publish or to archive it.

Final preparation of the data and publishing it will require 6 months. This will be supported by Open Science Center of the University of Jyväskylä.