

FWO DMP

Project Name PHD (FWO DMP) - FWO DMP

Grant Title 1S27522N

Principal Investigator / Researcher Chloe Halbach

Project Data Contact Chloe Halbach

Description The objective of this project is to design and develop a large-area flexible and stretchable capacitive ultrasound transducer array for medical imaging. To achieve this, we will rely on a combination of multi-physics simulation, microfabrication and experimental characterization.

Institution KU Leuven

1. General Information

Name applicant

Chloe Halbach

FWO Project Number & Title

1S27522N - Flexible and stretchable capacitive ultrasound transducer array for medical imaging

Affiliation

- KU Leuven

2. Data description

Will you generate/collect new data and/or make use of existing data?

- Generate new data

Describe in detail the origin, type and format of the data (per dataset) and its (estimated) volume. This may be easiest in a table (see example) or as a data flow and per WP or objective of the project. If you reuse existing data, specify the source of these data. Distinguish data types (the kind of content) from data formats (the technical format).

Project management & training

	Type	Format	Volume	Storage	Folder
Theoretical and soft skills courses	Course book, presentations, assignments	.pdf, .pptx, .docx	5 GB	Onedrive	PhDProgress > TheoreticalCourses > SoftSkills
	Notebook	OneNote	N/A	Synchro with Onedrive	Trainings
Scientific communication	Articles, presentations, posters, manuscript for publication	.docx, .pptx, .pdf	2 GB	Onedrive Overleaf Final version in Sharepoint	PhDProgress > ScientificCommunication Final version in Publications
Time management	Planning and time tracking	.xlsx	20 KB	Toggl Track Onedrive	PhDProgress > TimeManagement
Administration	Blueprint, diary, bench fee	.docx, .xlsx, .pdf	100 MB	Onedrive	PhDProgress > Administration
Meetings and brainstorm sessions	Notebook	OneNote	N/A	Synchro with Onedrive	Meetings
	Presentation	.pptx	200 MB	Onedrive	PhDProgress > PhDProgressMeetings

Literature study

Type	Format	Volume	Storage	Folder
Notebook with detailed content from literature study	Obsidian	2 GB	Synchro with Onedrive	LiteratureStudy
Summary of literature study	.pptx, .docx	1 GB	Sharepoint	Literature
Articles mentioned in summary of literature study	.pdf	1 GB	Sharepoint	Literature

Design based on analytical models & finite element method

Type	Format	Volume	Software	Storage	Folder
Finite element model	.mph, .m	1 GB	Comsol	Sharepoint	Modeling
Script to run finite element model or analytical model	.m	10 KB	Matlab		
Output data from simulation	.txt, .png, .xlsx	10 KB			
Script to process data	.m	10 KB	Matlab		
Summary of simulation methodology and results	.pptx	1 GB			

Microfabrication

	Type	Format	Volume	Storage	Folder
Brainstorm sessions	Notebook	OneNote	N/A	Synchro with Sharepoint	Meetings
	Presentation	.pptx	200 MB	Sharepoint	Processing > Brainstorm sessions
Planning shortloops	Work plan	.xlsx	100 KB	Sharepoint	Processing > Planning
Overview of runs with detailed process flow and characterization results	History of process steps, summary and interpretation of results	.pptx, .xlsx	1 GB	Sharepoint	Processing >Experiments
	Raw data	.csv, .png, .jpg, .tiff			
Mask design	KLayout design of each version	.gds, .lyp	2 MB	Sharepoint	Processing > Masks
	History of modifications	.docx	10 KB		
	Overview of features and mask design	.pptx	1 MB		
Physical samples	Masks for photolithography	7 inch		Dedicated storage place in cleanroom	
	Silicon and glass wafers	6 inch or dice			

3. Legal and ethical issues

Will you use personal data? If so, shortly describe the kind of personal data you will use. Add the reference to your file in KU Leuven's Register of Data Processing for Research and Public Service Purposes (PRET application). Be aware that registering the fact that you process personal data is a legal obligation.

- No

Privacy Registry Reference:

Short description of the kind of personal data that will be used:

Are there any ethical issues concerning the creation and/or use of the data (e.g. experiments on humans or animals, dual use)? If so, add the reference to the formal approval by the relevant ethical review committee(s)

- No

Does your work possibly result in research data with potential for tech transfer and valorisation? Will IP restrictions be claimed for the data you created? If so, for what data and which restrictions will be asserted?

- Yes

A confidentiality agreement has been established between the researcher and imec, meaning that approval in writing from imec will be required to publish contents of the research and disclose results to third parties.

Data regarding microfabrication may become part of a patentable invention. In this case, a discussion with the imec

patent group will be initiated before the publication of a research paper.

Do existing 3rd party agreements restrict dissemination or exploitation of the data you (re)use? If so, to what data do they relate and what restrictions are in place?

- No

4. Documentation and metadata

What documentation will be provided to enable reuse of the data collected/generated in this project?

Cmsol simulations

Raw simulation data (generated automatically in .txt files or handwritten in .xlsx spreadsheets) are collected per simulation test in the same folder as the used Cmsol model. The Cmsol model is saved in .mph format (can only be opened with a compatible licence version) and in .m format. The latter format can be opened with Matlab or as .txt file to view details about the model and simulation parameters without Cmsol licence.

Raw data are stored in .txt files with the following details:

- name of the model
- licence version (needed to open the model)
- date of simulation

The filename is chosen such that it is clear what the data represent and what the value is of the varied parameter(s) compared to the initial model.

A Matlab script (also stored in the same folder) is used to convert raw data (.txt files) to graphs or to extract specific values of interest. This Matlab script also contains information about the definition and units of variables. Matlab post-processed data are then collected as graphs (.png, .tif or .svg) or as individual data points in detailed .xlsx spreadsheets.

Finally, a .pptx presentation is created per simulation test to explain the methodology and summarize the most important results and conclusions.

Microfabrication

For each experiment, a history of all the process steps that a wafer undergoes is reported in a .xlsx spreadsheets with the following details:

- date
- process step
- tool
- process/characterization parameters
- process comments

For each process step, raw data and post-processed data are stored in dedicated folders per characterization method (optical microscope, atomic force microscope, surface profilometry, etc.). The name of each file clearly indicates which sample has been characterized.

Finally, a .pptx presentation is created per experiment to explain the methodology and summarize the most important results and conclusions.

Will a metadata standard be used? If so, describe in detail which standard will be used. If no, state in detail which metadata will be created to make the data easy/easier to find and reuse.

- No

There is no metadata standard available. The data will be stored and named in a consistent manner. As described in the previous question, Matlab scripts (.m), spreadsheets (.xlsx), and presentations (.ppt) will make it easier to navigate through and interpret the collected data.

5. Data storage and backup during the FWO project

Where will the data be stored?

During the FWO project, data related to the PhD progress (e.g. theoretical courses, articles in progress, ...) will be stored in a personal OneDrive storage account and data related to the conducted experiments (simulations, microfabrication and characterization) will be stored in Sharepoint, in a channel dedicated to the FWO project. The Onedrive and Sharepoint storage accounts are both offered by imec.

How is backup of the data provided?

Imec Onedrive and Sharepoint take automatic daily back-ups.

Is there currently sufficient storage & backup capacity during the project? If yes, specify concisely. If no or insufficient storage or backup capacities are available then explain how this will be taken care of.

- Yes

Files in OneDrive and Sharepoint are saved at cloud location, hence there should be sufficient storage space.

What are the expected costs for data storage and back up during the project? How will these costs be covered?

The costs will be covered by imec.

Data security: how will you ensure that the data are securely stored and not accessed or modified by unauthorized persons?

All the data is stored in imec's secure environment. Researchers from imec contributing actively to the FWO project have

access to the Sharepoint channel, while others will receive a protected link to access more specific data. When sharing the link, the author can specify whether data can be edited or not.

6. Data preservation after the FWO project

Which data will be retained for the expected 5 year period after the end of the project? In case only a selection of the data can/will be preserved, clearly state the reasons for this (legal or contractual restrictions, physical preservation issues, ...).

All the computer data will be retained for at least 10 years after the end of the project, conform the KU Leuven RDM policy. Wafers will be stored for at least 1 year after fabrication. After 1 year, they will be destroyed to make space for other samples if they are fully characterized. The definition of fully characterized means that we do not need them anymore for further measurements.

Where will the data be archived (= stored for the longer term)?

All the computer data will be saved on the imec's servers (Sharepoint) for at least 10 years after the end of the project, conform the KU Leuven RDM policy.

What are the expected costs for data preservation during the retention period of 5 years? How will the costs be covered?

The costs will be covered by imec.

7. Data sharing and reuse

Are there any factors restricting or preventing the sharing of (some of) the data (e.g. as defined in an agreement with a 3rd party, legal restrictions)?

- Yes. Specify:

A confidentiality agreement has been established between the researcher and imec, meaning that approval in writing from imec will be required to publish contents of the research and disclose results to third parties.

Which data will be made available after the end of the project?

After publication of the research results, the full datasets can be made available upon request and upon imec's approval.

Where/how will the data be made available for reuse?

- Upon request by mail

Data will be available upon request and upon imec's approval by sending a mail with a protected link to the data stored on imec's server.

When will the data be made available?

- Upon publication of the research results

Imec is entitled to postpone each and every publication by not more than 6 months to allow imec to take the necessary steps in order to obtain intellectual property protection for the results included in such publication. Data that has not been published can be shared later on upon imec's approval.

Who will be able to access the data and under what conditions?

Data that has not been disclosed in publications can only be shared upon imec's approval. Access will be considered after a request is submitted explaining the planned reuse.

What are the expected costs for data sharing? How will the costs be covered?

No costs are expected as most data can be shared via online platforms.

8. Responsibilities

Who will be responsible for data documentation & metadata?

Chloe Halbach

Who will be responsible for data storage & back up during the project?

Chloe Halbach

Who will be responsible for ensuring data preservation and reuse ?

David Cheyns

Who bears the end responsibility for updating & implementing this DMP?

David Cheyns