Towards design automation of magnetic components for ultra-compact power converters in electromobility applications

Research Data Summary

List and describe all datasets or research materials that you plan to generate/collect or reuse during your research project. For each dataset or data type (observational, experimental etc.), provide a short name & description (sufficient for yourself to know what data it is about), indicate whether the data are newly generated/collected or reused, digital or physical, also indicate the type of the data (the kind of content), its technical format (file extension), and an estimate of the upper limit of the volume of the data.

Dataset name / ID	Description	New or reuse	Digital or Physical data	Data Type	File format	Data volume	Physical volume
		*Indicate: **N**(ew data) or **E**(xisting data)*	Indicate: **D**(igital) or **P**(hysical)	Indicate: **A**udiovisual **I**mages **S**ound **N**umerical **T**extual **M**odel **SO**ftware Other (specify)		Indicate: <1GB <100GB <1TB <5TB >5TB NA	
Mat_Exp	Characterisation of magnetic materials: raw data, losses	N	D	N	*.xlsx*, .csv, .mat	<1GB	
Mat_Exp_images	Waveforms, pictures of experimental setups, prototypes, instrument measurements	N	D	I	.jpeg, .png	<1GB	
MagComp_geo_sim	Geometry of the magnetic component to simulate with finite elements	N	D	M	.geo	<1GB	
MagComp_msh_sim	Mesh of the magnetic component to simulate with finite elements	N	D	M	.msh	<1GB	
MagComp_pro_sim	Finite element simulation file	N	D	M	.pro	<1GB	
ROMgen_MagComp_sim	Generation of reduced-order model of magnetic components	N	D	M	.m or .py	< 1GB	
ROM_MagComp_sim	Reduced order model of magnetic material to integrate in system level simulation	N	D	M	.mat or .pos	<1GB	
Circuit_sim	Circuit simulation	N	D	M	.slx, .mld or .cir	<1GB	
System_sim	System level simulation including ROM	N	D	M	.slx, .mld or .cir	<1Gb	
Scientific reports	Descriptions of the developed methods and methodology, comparison of simulation and experiments, analysis of results	N	D	T	*.pdf	<1Gb	

If you reuse existing data, please specify the source, preferably by using a persistent identifier (e.g. DOI, Handle, URL etc.) per dataset or data type:

NA

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, refer to specific datasets or data types when appropriate and provide the relevant ethical approval number.

- No

Will you process personal data? If so, please refer to specific datasets or data types when appropriate and provide the KU Leuven or UZ Leuven privacy register number (G or S number).

- No

Does your work have potential for commercial valorization (e.g. tech transfer, for example spin-offs, commercial exploitation, …)? If so, please comment per dataset or data type where appropriate.

- No

Do existing 3rd party agreements restrict exploitation or dissemination of the data you (re)use (e.g. Material or Data transfer agreements, Research collaboration agreements)? If so, please explain in the comment section to what data they relate and what restrictions are in place.

- No

Are there any other legal issues, such as intellectual property rights and ownership, to be managed related to the data you (re)use? If so, please explain in the comment section to what data they relate and which restrictions will be asserted.

- No

Documentation and Metadata

Clearly describe what approach will be followed to capture the accompanying information necessary to keep data understandable and usable, for yourself and others, now and in the future (e.g. in terms of documentation levels and types required, procedures used, Electronic Lab Notebooks, README.txt files, codebook.tsv etc. where this information is recorded).

- Measurement datasets (Mat_Ext) will contain in file information describing the measurement setup, equipment employed and notes in a separate tab of the file.
- Onelab simulation files (MagComp_geo_sim, MagComp_pro_sim) will start with the creation date, the description on the different possibilities available (formulations/equations treated), parameters that can be adapted (dimensions, material characteristics, working frequency, voltage or current source, amplitude and waveform). Command line used for generating the mesh file (MagComp_msh_sim), command line used for solving the finite element problem.
- Circuit simulation files (Circuit_sim, Sys_sim) will be accompanied by a README.txt file describing the content and usage.
- Reduced-order model files (ROMgen_MagComp_sim, ROM_MagComp_sim) will contain in file comments that explain the inputs (from finite elements) and outputs (to circuit or to Onelab).

Will a metadata standard be used to make it easier to find and reuse the data?
If so, please specify which metadata standard will be used.

If not, please specify which metadata will be created to make the data easier to find and reuse.

- Yes

Regular KU Leuven regulations. RDR will be used.

Data Storage & Back-up during the Research Project

Where will the data be stored?

- Sharepoint online

How will the data be backed up?

- Standard back-up provided by KU Leuven ICTS for my storage solution

Is there currently sufficient storage & backup capacity during the project?

If no or insufficient storage or backup capacities are available, explain how this will be taken care of.

- Yes

How will you ensure that the data are securely stored and not accessed or modified by unauthorized persons?

KU Leuven Sharepoint requires authorisation for accessing data. Only authorised people are able to read and/or modify.

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

Existing servers will be used.

Data Preservation after the end of the Research Project

Which data will be retained for 10 years (or longer, in agreement with other retention policies that are applicable) after the end of the project?

In case some data cannot be preserved, clearly state the reasons for this (e.g. legal or contractual restrictions, storage/budget issues, institutional policies...).

- All data will be preserved for 10 years according to KU Leuven RDM policy

Where will these data be archived (stored and curated for the long-term)?

- KU Leuven RDR

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

The long-term storage is guaranteed up to 10 years after the end of a project. This is stored in KU Leuven servers. The members of the research group have access to the data with the permission of the supervisor(s).

Data Sharing and Reuse

Will the data (or part of the data) be made available for reuse after/during the project?
Please explain per dataset or data type which data will be made available.

- Yes, as restricted data (upon approval, or institutional access only)

If access is restricted, please specify who will be able to access the data and under what conditions.

The collected data will be accessible to the PhD and PostDoc researchers, working with the two promoters of this C2 project, prof. Ruth V. Sabariego and prof. Wilmar Martinez.

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

Please explain per dataset or data type where appropriate.

- Yes, intellectual property rights

Where will the data be made available?

If already known, please provide a repository per dataset or data type.

- KU Leuven RDR (Research Data Repository)

When will the data be made available?

- Upon publication of research results

Which data usage licenses are you going to provide?

If none, please explain why.

- Other (specify below)

Do you intend to add a persistent identifier (PID) to your dataset(s), e.g. a DOI or accession number? If already available, please

provide it here.

- Yes, a PID will be added upon deposit in a data repository

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

No additional costs are foreseen.

Responsibilities

Who will manage data documentation and metadata during the research project?

Project promoter Ruth V. Sabariego

Who will manage data storage and backup during the research project?

Project promoter Ruth V. Sabariego

Who will manage data preservation and sharing?

Project promoter Ruth V. Sabariego

Who will update and implement this DMP?

Project promoter Ruth V. Sabariego