Title

Parameter Estimation for Model-Based Sensing of Magneto-Mechanical Resonators

Authors

Sarah Reiss; 0009-0006-4015-1200
Institute for Biomedical Imaging, Hamburg University of Technology, Hamburg, Germany
Section for Biomedical Imaging, University Medical Center Hamburg-Eppendorf, Hamburg, Germany

Tobias Knopp; 0000-0002-1589-8517
Institute for Biomedical Imaging, Hamburg University of Technology, Hamburg, Germany
Section for Biomedical Imaging, University Medical Center Hamburg-Eppendorf, Hamburg, Germany

Justin Ackers; 0000-0003-1049-0528
Fraunhofer Research Institution for Individualized Medical Technology and Engineering IMTE, Lübeck, Germany

Jonas Faltinath; 0009-0003-4128-2948
Institute for Biomedical Imaging, Hamburg University of Technology, Hamburg, Germany
Section for Biomedical Imaging, University Medical Center Hamburg-Eppendorf, Hamburg, Germany

Fabian Mohn; 0000-0002-9151-9929
Institute for Biomedical Imaging, Hamburg University of Technology, Hamburg, Germany
Section for Biomedical Imaging, University Medical Center Hamburg-Eppendorf, Hamburg, Germany

Marija Boberg; 0000-0003-3419-7481
Institute for Biomedical Imaging, Hamburg University of Technology, Hamburg, Germany
Section for Biomedical Imaging, University Medical Center Hamburg-Eppendorf, Hamburg, Germany

Nora Timm; 0009-0001-2591-2925
Fraunhofer Research Institution for Individualized Medical Technology and Engineering IMTE, Lübeck, Germany

Martin Möddel; 0000-0002-4737-7863
Institute for Biomedical Imaging, Hamburg University of Technology, Hamburg, Germany
Section for Biomedical Imaging, University Medical Center Hamburg-Eppendorf, Hamburg, Germany

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1 General Information

Dataset Title

Supplementary Data for the Publication: Parameter Estimation for Model-Based Sensing of Magneto-Mechanical Resonators

Short Description

The data set contains the experimental data of the paper "Parameter Estimation for Model-Based Sensing of Magneto-Mechanical Resonators".

Date of Data Collection:

2025-08-25 – 2026-01-23

Geographical Coverage

Hamburg

Keywords

magneto-mechanical resonator, model-based sensing, online parameter estimation, inverse problem, multi-component signal

2 Methodological Information

The data was collected using our in-house sensing system, which consists of a 3D circular coil arrangement. This system is used to excite the magneto-mechanical resonator with oscillating magnetic fields, followed by a readout of the inductive sensor response. Uncontrolled (Experiment 1) and controlled (Experiment 2) measurements were conducted using two different magneto-mechanical resonators. Further information can be found in the corresponding publication.
The data accompany the repository: `https://github.com/IBIResearch/MMR-Parameter-Estimation`.

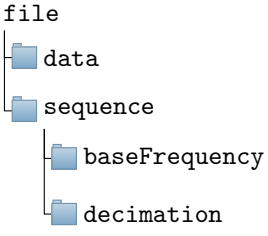
3 Data and File Overview

The current dataset includes the experimental data for uncontrolled (Experiment 1) and controlled (Experiment 2) measurements of two magneto-mechanical resonators (MMRS and MMRL).

File	Description	Format	Size
Exp1_MMRL	Raw data files	HDF5	366.2MB
Exp2_MMRL	Raw data files	HDF5	262.2MB
Exp1_MMRS	Raw data files	HDF5	73.2MB
Exp2_MMRS	Raw data files	HDF5	54.9MB

Table 1: List of files

Each file is structured as shown below. Data has a size of: (numRXSamples, numChannels, numFrames) with numChannels being the amount of used coils (= 3). The sampling time can be calculated with decimation / baseFrequency.



4 Access and Licensing Information

DOI of data supplement: 10.15480/882.16742

5 Versioning and Updates

Version Number: v1.0
Date of Release: 2026-02-23

6 Contact Information

Name: Tobias Knopp
Institution: Institute for Biomedical Imaging
Email: tobias.knopp@tuhh.de
ORCID: 0000-0002-1589-8517