

Passive Implantable Passive Sensor: process variation study

Motivation

Cardiovascular diseases are one of the main death causes in industrialized countries.

Among those, the number of patients suffering from Heart Failure (HF) is estimated to increase in the next years, having a prevalence of at least 3% among the worldwide population.

Because of the poor prognosis and the late detection of the disease, half of the patients do not reach 5 years of survival.

Project

The aim of this interdisciplinary project is to develop a new passive implantable sensor based on acoustics interrogation, with the ultimate goal to estimate the early on-set of the disease and improve patients' life.

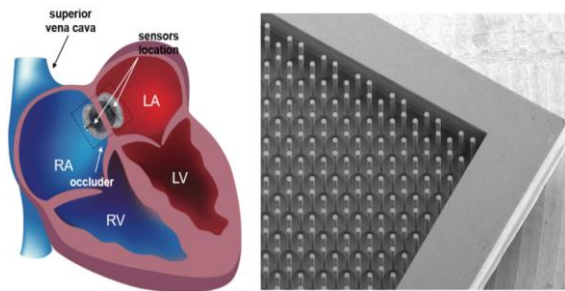


Figure 1: Schematic of the implanted sensing device in the human heart and SEM detail.

Your Task

Your task will analyze the influence of fabrication process variations (e.g. etching) in the sensor response through comparison with SEM measurements and FEM model.

Your Profile

- You are a student with a background in mechanical engineering/physics, looking for an interdisciplinary Bachelor or Semester project.
- You have an overview of fabrication processes.
- You are more than familiar with FEM tools (e.g. Comsol).
- You are interested in gaining experience in an interdisciplinary project at the edge with physics, nanotechnology and medicine.

You will learn how to:

- Apply your theoretical knowledge in a real engineering problem
- More insight into FEM tools
- Scientifically present your data
- Work in an interdisciplinary project with engineering and medical requirements
- SEM (Scanning Electron Microscope) at the D-MAVT clean-room facilities

Contains: SEM measurements (30%), FEM implementation (35%), comparison and analysis (35%)

Contact:

Lucrezia Maini

CLA G13

Micro and Nanosystems

lucrezia.maini@micro.mavt.ethz.ch

+41 (0) 44 632 24 13

ETH

Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

Micro and Nanosystems

<http://www.micro.mavt.ethz.ch/>