

# Student Master Project

Project title: Development phantoms for Implantable antenna and sensing applications.

Project type: Master Thesis Project

Faculty and Research group: EEMCS, RadioSystems Group

Contact:

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## Project description

Phantoms are artificially made body equivalent tissues, used to study the interaction of electromagnetic field with biological tissue in various used cases. They are mainly replacing the human/animal body/tissue to avoid direct radiation exposure. Implantable antennas and biological sensors require preliminary testing in phantoms to confirm their suitability for real application. Tissue equivalent phantoms (in semisolid form) with equivalent dielectric parameters at microwave frequency are in great demand and challenging.

The novelty of this project is the development of such phantoms suitable for biomedical applications that is presently investigating at RS.

Type of work: Theory 30%, Experimental 40%, Documentation & Reporting 30%

## Student tasks

1. Fabrication of phantoms equivalent to various human body parts such as Muscle, Skin, Fat and bone. Which includes
  - Controlling strategy for Real part and imaginary part of permittivity.
  - Development of phantoms with various thickness
  - Identification of property decay factors with time.
  - Shaping the phantoms
2. Measurement of the dielectric parameters of the phantoms with state of the art measurement techniques.