

Exjobb / Master Thesis work or project

Manufacture and testing of a coplanar waveguide for biophysics applications

Your Background

You enjoy experimental work
You are familiar with chemistry
You understand optics
You are creative in your work

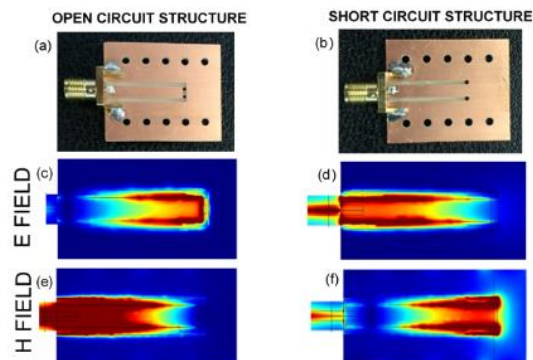
Equipment available

All the chemical reagents for nanoparticle synthesis and the experimental tools for this work are available. If any more are needed to explore research ideas, we can buy them.

Contact information

BioPhysics & BioPhotonics group
Magnus Andersson
Phone: 090-786 6336
magnus.andersson@umu.se
Department of Physics
Umeå University
Sweden

Homepage: [here](#)



Project Goals

1. Design the geometry for a coplanar waveguide to fit the existing microscope system
2. Manufacture waveguides for use with different frequencies.
3. Calculate the expected magnitude of the field at the sample location.
4. Run a validation experiment, confirming that the device works as expected.

Background

The generation of localised high intensity electric and magnetic fields is of great interest in many fields. Localised fields allow for decoupling of thermal and the magnetic affect from the effect of the electric field itself.

Coplanar waveguides are a compact devices for generating an electric field compared to resonator cavities. Their allows for them to be small enough to be used in conjunction with microscopy and observe effects on the sample in real time.

We need small small coplanar waveguides, with different frequencies, to use together with our existing Laser Tweezer system to observe the effects of localised field on single cells, bacterial spores, and viral particles. Understanding the mechanisms of field-mediated disruption is essential in delepment of nex generation of rapid diagnostics systems.

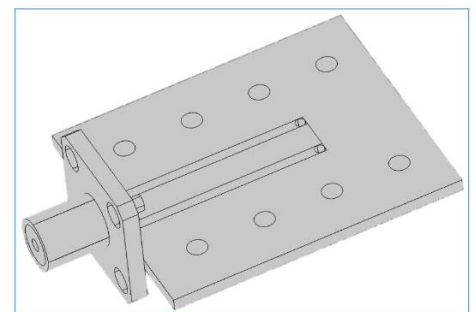


Figure 1. Schematic of one of the published configurations of a coplanar waveguide.

