MICROWAVE LAB

UNIVERSITY OF PAVIA

university of pavia

H - floor

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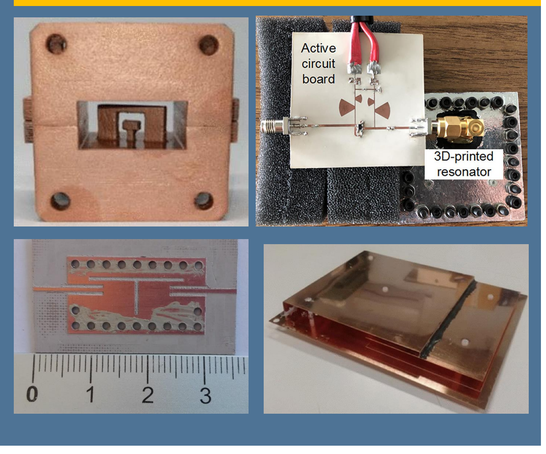
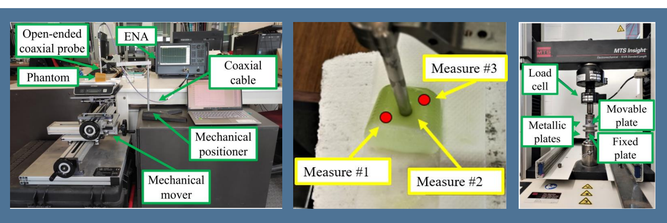
PASSIVE COMPONENTS

One of the main topics of research of the lab is the design and synthesis of passive components for applications such as wireless telecommunication, radar, and material characterization and sensing. In particular, the research focuses on novel technologies like *additive manufacturing* (3D printing) or *substrate integrated waveguide* to improve performance, reduce size or lower production cost of components such as cavity resonator sensors, microwave filters, and antenna arrays.



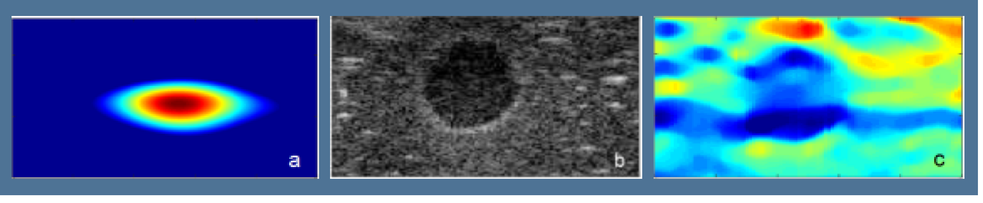
MULTI-MODAL IMAGING



Experimental setups for dielectric and mechanical properties measurements.

We are focused in the use of microwave and millimeter-wave imaging in the biomedical field. Besides the traditional diagnostic techniques, the study of the dielectric properties of biological tissues could provide additional information to the clinicians and help to make more accurate evaluations of the patients.

Analysis of the same phantom with mm-wave imaging (a), US B-Mode imaging (b), elastography (c).



SPACE COMMUNICATIONS

We are also working on antennas used in space communications. In particular, on the analisys and design of next-generation ground stations used in different space projects, from low orbit satellites to deep space probes. This is possible thanks to several collaborations with the European Space Agency (ESA) and with leading companies in Europe, such as Thales Alenia Space, with which we are involved, for example, in the design of the fourth ESA Deep Space Antenna.

SNOWAVE

Last but not least, our laboratory works also in the developement of radar systems for cryosphere monitoring. Snow and glaciers can be sensed and studied with a radar architecture called SNOWAVE. Simulations, theoretical studies and field tests in alpine or arctic environment have to be done. The recorded data are useful for the analysis of the properties of the snow, in order to predict avalanches or understand how much water can be available. Collaboration with Italian and European institutes and universities are now active.