This thesis deals with the measurement of complex permittivity of biological tissue as the default precondition for the design of thermo-therapeutic microwave applicators for hyperthermia oncology treatment, when for the valid simulations of electromagnetic field is necessary to know the dielectric parameters of the environment.
There are described different approaches to measure complex permittivity, in particular the non-invasive method of measuring complex permittivity at the end of the coaxial cable.
For this purpose two measuring probes have been designed, constructed and tested. The first one based on N-connector and the second based on the SMA-connector.
Simulations of the probe's models were simulated in program SEMCAD 14 and double checked by CST MICROWAVE STUDIO 2009.
The possibilities of measuring complex permittivity of biological tissue as a potential diagnostic imaging method are also discussed. Measurements in order to demonstrate the diagnostic potential of this method were first conducted on artificially created non-homogeneous agar phantom with added mixture of various dielectrics, followed by measurement of biological tissue in vivo.