ABSTRACT

Material losses play important role in high frequency applications. Ferrite materials have special use in industrial applications. Broad band data on dielectric properties (permittivity and permeability) of materials is highly required. The study has been carried out to design coaxial sample holder (Transverse electromagnetic cell) for broadband material characterizations. The basic idea of this research problem is to analyze a practical setup where material measurements are easy to implement. This thesis presents a method based on coaxial transmission line for measurements of permittivity and permeability of materials in frequency range from 200MHz to 3GHz. The first step is based on simulation software HFSS (High frequency structure simulator) and second step is code formation on MATLAB using Nicolson-Ross-Weir mathematical model to retrieve the dielectric properties of insulators and magnetic materials. Afterwards practical design of sample holder is formed on Auto-Workshop Inventor and results are plotted.