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Discipline: Physics

<u>Sub discipline</u>: Electromagnetism

<u>Area of Research</u>: Material characterization at microwave frequency, nanomaterial based cancer cell killing, Wireless power transfer

<u>Skills</u>: Network Analyzer, Spectrum Analyzer, 3D electromagnetic simulation software – HFSS, COMSOL, SONNET

Research Summary (current, performed in last 5 years, 300 words or less): My research is area is characterization of material at microwave frequencies. In this characterization process, when electromagnetic signal is applied to a sample inside a closed metallic chamber, there generates a reflected and transmitted wave. Using these reflected and transmitted signal data, material property is determined by solving a complex equation using Newton's method. Recently this research is extended in characterizing cancer cells. At present, I am trying to observe temperature rise (or hysteretic) property of Carbon Coated Ferrite Nano particles (CFN) and trying to make a connection between CFN's hysteretic property and its electrical property, which, in fact, will help to understand the physics behind cancer cell killing with CFN by microwave radiation.

<u>Key Words</u> (5 maximum): Material characterization, Carbon coated ferrite nano particles, complex permittivity, Cancer cell killing by nanomaterials and microwave radiation