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Magnetic permeability and dielectric permittivity of ferrite materials in millimeter waves. KONSTANTIN KOROLEV, Institute of Radioengineering and Electronics of RAS, Moscow, Russia; Tufts University, Medford, MA 02155, USA, LAKSHMI SUBRAMANIAN, MOHAMMED AFSAR, Tufts University, Medford, MA 02155, USA — Magneto-optical approach for the measurements of complex magnetic permeability and dielectric permittivity of solid and powdered strontium ferrite materials have been performed in the frequency range of 34-120 GHz. Free-space quasi-optical millimeter wave spectrometer equipped with a backward wave oscillator as a tunable source of coherent radiation provides the transmittance spectra in transverse magnetic field up to 7.5 kOe. Frequency dependences of dielectric and magnetic parameters of strontium ferrites have been calculated by matching theoretical curves to the experimental transmittance spectra. Shift of the ferromagnetic resonance to higher frequencies and the broadening of the zone of strong absorption in transverse magnetic field have been observed for solid ferrite materials. A relation between the specific gravity and the saturation of magnetization for these materials has been found. The shift of ferromagnetic resonance frequency vs. specific gravity has been observed. The correlations between complex dielectric permittivity and magnetic permeability and density of the samples have been observed.

Konstantin Korolev
Tufts University, Medford, MA 02155, USA

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