IEEE Transactions on Instrumentation and Measurement, vol.51, no.6, pp.1246-1251, December, 2002.

Frequency response of a thin cobalt film magnetooptic sensor

G. Robles Muñoz; R. Giannetti

Abstract-

The magnetooptic effect is due to a change in the po-larization of the light when it is reflected or passes through a mag-netized material. The rotation of the polarization plane is propor-tional to the magnetic field. The great advantage of using a mag-netooptic sensor to measure intensity or magnetic fields is its wide bandwidth. This fact is widely known; however, no effective mea-surements have been taken. In this paper, we present the frequency response of a cobalt thin film used as magnetooptic material. It was first excited by several sinusoidal magnetic fields at different frequencies. The range of frequencies studied in the first experi-ment reached 179 Hz, which is suitable for measuring power line intensity or magnetic fields. Because the coil that creates the mag-netic field has a great impedance at higher frequencies, an alter-native method based on magnetic impulses has been designed to obtain high-frequency data. With the latest experiments we have been able to measure frequencies as high as 2 MHz, obtaining a flat frequency response.

Index Terms- Ferromagnetic materials, magnetic field measurement, sensors

Citation:
Giannetti, R.; Robles, G. "Frequency response of a thin cobalt film magnetooptic sensor", IEEE Transactions on Instrumentation and Measurement, vol.51, no.6, pp.1246-1251, December, 2002.