## 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

Due to copyright restriction we cannot distribute this content on the web. However, clicking on the next link, authors will be able to distribute to you the full version of the paper:

Request full paper to the authors

If you institution has a electronic subscription to IEEE Transactions on Instrumentation and Measurement, you can download the paper from the journal website:

Access to the Journal website

## **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.