PROBING FERROMAGNETS AT THE MICRON LEVEL*

Philip E. Wigen
Department of Physics, Ohio State University, Columbus, Ohio 43210, USA
wigen.1@osu.edu

9.7 cm

With the development of fabrication methods to produce materials and devices at nanoscale dimensions, there is a need for the development of new techniques to characterize the materials in new devices at these dimensions. In the field of magnetic materials these devices include spintronic elements and submicron magnetic memory storage elements. Magnetic Resonance Force Microscopy (MRFM) is a new technique first observed in 1992 and has the theoretical sensitivity of single spin detection and atomic resolution. MRFM combines the principles of magnetic resonance with those of scanned probe technology to detect spin resonance through mechanical, rather than inductive, means. This talk will review the recent progress in the field using both NMRFM and ESRFM. Ferromagnetic resonance force microscopy (FMRFM), a third variant of MRFM first demonstrated in 1996, is an application developed to investigate ferromagnetic samples. It enables (a) the characterization of the dynamic magnetic properties of magnetic structures at the *micron scale*, and (b) the spatial resolution of the ferromagnetic resonance mode within such samples. In addition the technique will (c) lead to the observation of localized resonances due to the strong perturbation of the probe magnet on the sample.

* This collaborative work is carried out jointly with Caltech (Roukes Group) and LANL (Hammel Group)

13.4 cm

Subject category :

Presentation mode :
invite lecture

Corresponding author :
P.E. Wigen

Address for correspondence :

Address prior 1 May 2002	After 1 May 2002
Condensed Matter Physics	Dept. of Physics
Caltech 114-36	Ohio State University
Pasadena, CA 91125	174 West 18th Ave.
USA	Columbus, OH 43210, USA
phone 626-395-2915	614-292-7439
fax 626-683-9060	614-292-7557

Email address :
wigen@osu.edu