PRECESSIONAL MAGNETIZATION DYNAMICS

B. Koopmans

Department of Applied Physics and center for NanoMaterials (cNM), Eindhoven University of Technology, P.O. Box 513, 5600 MB, Eindhoven, The Netherlands

Contents

1 – MACROSPIN DYNAMICS & LLG

- 1-1 Precessing spin from a quantum mechanical viewpoint
- 1-2 Landau-Lifzhits Gilbert equation
- 1-3 Damping of precessional modes
- 1-4 Small angle precession and Kittel relation for thin film systems
- 1-5 Precessional switching

2 – MEASURING PRECESSIONAL DYNAMICS

- 2-1 Time and frequency domain techniques
- 2-2 FerroMagnetic Resonance
- 2-3 Brillouin Light Scattering
- 2-4 Time domain techniques: magnetic field & optical excitation
- 2-5 Time-Resolved Magneto-Optical Kerr Effect
- 2-6 Pulsed Inductive Microwave Magnetometer

3 – SPIN WAVES IN THIN FILMS AND MULTILAYERS

- 3-1 Perpendicular standing spin wave modes
- 3-2 All-optically probing spin wave dispersion
- 3-3 Spin wave dispersion for different orientation of M and k
- 3-4 Emission of spin waves after local excitation
- 3-5 Damping by spin pumping

4 – MICROMAGNETIC STRUCTURES AND DEVICES

- 4-1 Spin wave modes in micromagnetic structures
- 4-2 Mapping of modes by optical means
- 4-3 Dynamics of multilayered devices