MM 1 Hauptvortrag Eckhard Quandt

Zeit: Freitag 09:45–10:15 Raum: TU H1058

Hauptvortrag

MM 1.1 Fr 09:45 TU H1058

Exchange coupled magnetostrictive multilayers — •Eckhard Quandt — Center of Advanced European Studies and Research (caesar), Bonn

Sputter-deposited giant magnetostrictive thin films present an interesting approach to realize novel sensors or actuators as they offer features like contactless, high frequency operation, simple actuator designs and a cost-effective manufacturing technique. Essential for these applications was the development of exchange coupled multilayers showing low field giant magnetostriction. Particularly, multilayers consisting of amorphous giant magnetostrictive Tb-Fe layers with positive magnetostriction and nanocrystalline soft magnetic Fe-Co layers having a very high magnetization present a type of a spring-magnet-type system which shows very high magnetoelastic energies at very low fields [1]. The saturation field of these multilayers can be considerably reduced compared to single layer materials due to the increased magnetization and the reduced anisotropy while keeping relatively large values of the magnetostriction. In general, applications of these materials require a well-defined uniaxial in-plane anisotropy, which e.g. can be obtained by annealing under a magnetic field. Further materials development issues of these giant magnetostrictive multilayers will be discussed in view of a possible use as a very sensitive magnetic field sensor [2].

[1] Quandt, E.; Ludwig, A.: J. Appl. Phys. 85 (1999) 6232-37. [2] Stein, S.; Wuttig, M.; Viehland, D.; Quandt, E.: J. Appl. Phys., 2004 (in press).