EINLADUNG
ZUM SONDERSEMINAR

Am Montag, 21.09.2015, um 11:00 Uhr
Raum 56-415

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Future FePt Heat Assisted Magnetic Recording Technology

The focus is on heat-assisted magnetic recording (HAMR) media requirements and challenges to extend the areal density (AD) beyond recently achieved 1.4 Tb/in² [1]. Granular high anisotropy chemically ordered and well textured L10 FePtX-Y-perpendicular HAMR media with an average grain size <D>=6-10 nm, size distribution σD/D ~ 16-25% and Curie temperature distribution σTC/TC < 3% will be discussed. Reducing <D> down to 3-5 nm and achieving σD/D <10-15% in principal allows increasing AD up to about 4 Tb/in² [2]. X~ 10at% Cu or Ni reduces the Curie temperature by ~100 K below T_C,bulk=750 K and lowers the recording energy requirement. Grain segregants like Y=C, BN, SiO₂ and TiO₂ exchange decouple grains and achieve dominant perpendicular thermal conductivity. 10 nm thick fcc MgO(100) seed layers generate tensile stress in FePt which is grown at elevated temperature of 650°C on glass substrates and facilitates the formation of well-oriented grains. A c/a lattice parameter ratio close to 0.96 is consistent with chemical ordering > 90% and leads to high perpendicular magnetic anisotropy K_u > 5.10⁷ erg/cm³ [2]. High resolution STEM and EELS and high field > 10T hysteresis measurements are key experimental activities needed to characterize and optimize HAMR media [3,4].

The talk will include recent media modeling activities [5] and another important topic based on femtosecond magneto-optics, which allows investigation of the dynamical properties of granular FePt with temporal resolution in the time scale of a few picoseconds [6].


Der Gast wird betreut von Prof. Dr. B. Hillebrands
GÄSTE SIND HERZLICH WILLKOMMEN!