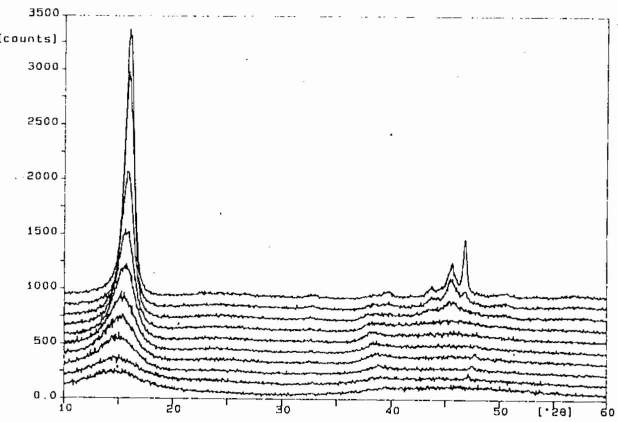


Fig. 1: Diffraction pattern of a 450 nm tick MoS_2 film at T = 35 (lower), 100, 200, 300, 400, 500, 600, 700, 800, 900°C (upper)

Parallel to the crystal growth a reduction of the fraction of stacking faults is observed indicated by the decrease of the c-lattice parameter and by the appearance of (hkl)-reflections. Differences in the initial film thickness influence the structural state of the untreated material but they disappear during heat treatment.

PS-11.02.16 THE STRUCTURE AND MAGNETIC ANISOTROPY OF Pt/Co MULTILAYERS By

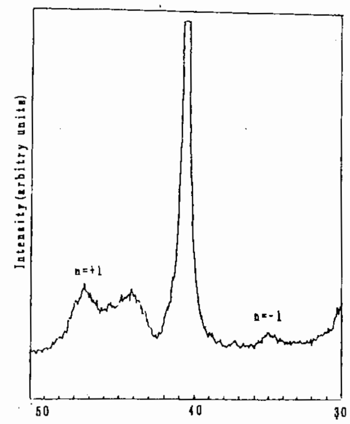
Zhi-hong Jiang*[1], Chang-lin Kuo[2], De-fang Shen[1], Rong-fa Guo[2], Tian-shen Shi[1]. 1) Shanghai Institute of Metallurgy, Chinese Academy of Sciences, Shanghai, P.R.China. 2) Shanghai Institute of Ceramics, Chinese Academy of Sciences, Shanghai, P.R.China

Recently, Pt/Co multilayer has stimulated the interests of many researchers due to its potential as a high-density magneto-optical storage material. Generally, such a candidate material must have a large Faraday or Kerr effect at short wavelength, a perpendicular anisotropy and a relatively large coercivity at room temperature. Pt/Co multilayers happen to satisfy all these conditions.

In our experiments, Pt/Co multilayers were prepared using dc magnetron sputtering on silicon substrates. The structures were determined by X-ray diffraction and the magnetic properties were measured by Kerr angle hysteresis loops. In table 1 are listed the sample parameters and their magnetic properties(omitted).

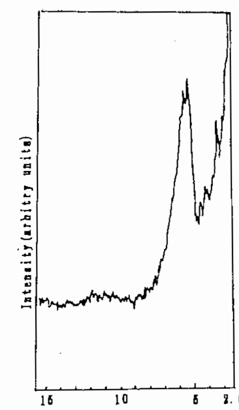
The low angle X-ray diffraction pattern, as shown in Fig.1, clearly confirmed the existance of multilayer structure of sample 1. The bilayer thickness deduced from Bragg fogmula agreed well with the sample parameter.

A simple simulation of high angle x-ray diffraction pattern was made. At any circumtances, the n=-1 satellite peak was higher than the n=+1 satellite peak, which is in contradiction to the real pattern(shown in Fig.2). We contribute this phenomena to the appearance of PtCo alloy at the interfaces, whose (111) peak overlaps with the Bragg peak of multilayers and (200) peak is at the same position of n=+1 satellite peak(C.-J. Lin and G.L.Górman, Appl. Phys. Lett., 1992, 61(13), 1600). In sample 2, when Co layer was much thicker, the multilayer diffraction overwhelmed the PtCo alloy diffraction and the relative heights of these two peaks reversed.



2θ (angle)

Fig.1 Low angle X-ray diffraction pattern of sample one



2θ(angle)

Fig.2 High angle X-ray diffraction pattern of sample one

In conclusion, we have found the PtCo alloy diffraction at Pt/Co multilayers. And the appearance of PtCo alloy did not destroy the perpendicular magnetic anisotropy which is believed to be mainly induced by interface anisotropy. the influence of interface atoms on the anisotropy can be further studied.

PS-11.02.17 CROSS-HATCHED SURFACE MORPHOLOGY IN **InGaAs/GaAs SUPERLATTICES.** By

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The cross-hatched morphology (CHM) has been commonly noticed in strained III-V semiconductor films (K. H. Chang et al, J. Appl. Phys., 1990, 67, 4093-4098). The CHM has been observed by means of Nomarski interference, x-ray topography, TEM, chathodeluminesence and photoluminesence but few results about the CHM were presented for InGaAs/GaAs strained-layer superlattices (SLSs).

In the present letter we report the x-ray topographic examinations of InGaAs/GaAs SLSs. The specimens used in the experiments were grown by molecular beam epitaxy (MBE) on GaAs substrates. The nominal structure of the SLS samples were 150 periods of 70 Å $In_{0.04}Ga_{0.96}As$ and 250 Å GaAs with about a 1 μm GaAs buffer layer and a 3 μm capping layer, respectively. In order to eliminate the influence of the capping layer on the reflection topographs a sample (denoted A) was etched to remove its capping layer. The synchrotron radiation experiments on sample A were performed at 4W1A beam line of the Beijing Synchrotron Radiation Facilities (BSRF).

The actual structure of the specimens were determined by the simulations of experimentally measured rocking curves based on the dynamic diffraction theory for deformed crystals (Z. H. Mai, S. F. Cui and C. G. He, Phys. Rev. B, 1990, 41, 9930-9934). Percentage relaxations of the two component layers of SLS were particularly found from the simulations.

224 reflection topographs were taken at the zeroth order peak of the SLS and the substrate peak, respectively. They were characterized as orthogonal striation parallel to the [110] and [$\bar{1}$10] directions, respectively. X-ray topographs were also taken under anomalous transmission conditions using Cu $K\alpha_1$ radiation (μt=17, where μ is the linear absorption constant and t the sample thickness). In 220 or $\bar{2}$20 anomalous transmission topographs shown in Fig. 1 the striations parallel to [110] or [$\bar{1}$10] disappeared, respectively. According to the invisibility criteria of dislocations, both the striations parallel to [110] or [$\bar{1}$10] were edge-type dislocations with Burger's vectors in [$\bar{1}$10] or [110] direction in the (001) growth plane.

It is interesting to see that in addition to the striations in the (001) growth plane other striations (see regions C of Fig. 1) which obeyed the same extinction law were observed on the cleavage planes of sample A. The stereoscopic topographs provide us a evidence that the misfit dislocations distribute over the SLS and

